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GLEANNINGS

IN BEE CULTURE

CONTENTS

Market Quotations	- 219
Stray Straws, by Dr. Miller	223
Pickings, by Stenog	- - - 225
Conversations with Doolittle	226
Editorials	- - - - - 227
Shallow Brood-chambers and 4x5 Sections	227
Formaldehyde for Foul Brood	228
Foul-brood Bills Before Various Legislatures	228
Carpet Grass, or Lippia Nodiflora	228
Forty Years Among the Bee	229
Ventilation in Bee Cellars	229
General Correspondence	- - - 231
Pridgen on Queen-rearing	231
Forced Swarms, by W. K. Morrison	233
Bee-keeping in Cuba, by E. M. Davidson	234
Nailing Hoffman Frames, by C. B. Thwing	235
Moving Bees, by A. E. <i>vb.</i> Faljo	236
Honey for the Grocery Trade, by M. Moyer	237
Cause of Weak Colonies, by A. C. Miller	238
Heads of Grain	- - - - - 242
Selling Honey Through U. S. Express	242
Carter's Cell-forming Stick	245
Golden and Leather-colored Bees Compared	246
Simple Method for Wiring Frames	247
Forced Swarms	248
The samson Hive	248
Notes of Travel	249

By A. I. Root

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Western Edition

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~~~~~  
Carl F. Buck, Augusta, Kansas.

Butler County.



Announcement!

We desire to call the attention of all bee-keepers in Washington, British Columbia, and adjacent territory, that we're now the Northwestern agents for

THE A. I. ROOT COMPANY,

and are prepared to furnish from stock here, and at other Washington points, any thing required by bee-keepers. Send your specifications early. If we do not have the goods wanted this will enable us to get them in our next carload. Catalogs free.

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FANCY.—All sections to be well filled, combs straight, firmly attached to all four sides, the combs unsoiled by travel-stain or otherwise; all the cells sealed except an occasional cell, the outside surface of the wood well scraped of propolis.

A No. 1.—All sections well filled except the row of cells next to the wood; combs straight; one-eighth part of comb surface soiled, or the entire surface slightly soiled the outside of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs comparatively even; one-eighth part of comb surface soiled, or the entire surface slightly soiled.

No. 2.—Three-fourths of the total surface must be filled and sealed.

No. 3.—Must weigh at least half as much as a full-weight section.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark; that is, there will be "Fancy White," "No. 1 Dark," etc.

NEW YORK.—There is a fair demand for white stock at 15 for fancy; No. 1, 13@14; amber, 12; with sufficient supply to meet the demand. Dark honey will be cleaned up with very little left. It is selling at about 11. Extracted honey rather weak, and in quantity lots prices are generally shaded. We quote white 7@7½; amber, 6½@7; dark, 6. Beeswax firm and scarce, and at good demand from 30@31 for good average.

HILDRETH & SEGELKEN,
Greenwich St., New York City.

Mar. 5. 265-7 Greenwood St., New York City.

CHICAGO.—The demand for comb honey has been and is of small volume. Prices are weak—concessions being made where necessary to effect sales. Fancy white comb is held at 15@16; all other grades of white irregular at 13@14; light amber, 10@12; dark and ambers, 9@10. Extracted clover and basswood, 7@8; other white grades, 6@7; amber, 5½@6½. Beeswax steady at 30.

R. A. BURNETT & Co.,
199 South Water St., Chicago, Ill.

Mar. 7.

BUFFALO.—There is very little honey in our market, and prices and demand better than usual at this season of the year. Fancy white comb, 15@16; A No. 1, 14@15; No. 1, 13½@14; No. 2, 12½@13; No. 3, 12@12½; No. 1 dark, 11@12; No. 2 dark, 10@11. Extracted, white, 7½@8; amber, 7@7½; dark, 6@6½. Beeswax, 28@30.

W. C. TOWNSEND,
167 Scott St., Buffalo, N. Y.

Mar. 7.

NEW YORK.—The market on comb honey is weak; demand has improved, but not enough to hold up prices. Fancy comb is worth 14@15; No. 1, 11½@13; Extracted, 1½@8½. Beeswax firm at 30@32.

FRANCIS H. LEGGETT & Co.,
Franklin and Varick Sts., New York.

Mar. 9.

CINCINNATI.—The demand for extracted honey is good at the following prices: Amber, barrels, 5½@6½, according to quality; white clover, 8@9. Fancy comb honey, 15½@16½. Beeswax strong at 30.

THE FRED W. MUTH CO.,
Front & Walnut Sts., Cincinnati, O.

Mar. 11.

PHILADELPHIA.—The season for comb honey is now nearly over, and very little call with some few sales. There is a large lot held back, this being offered at low prices, and market is a little weak. We quote fancy 14@15; No. 1, 14; amber, 12@13. Extracted fancy white, 7@8. Beeswax, 30, and in good demand. We are producers of honey, and do not handle on commission.

WM. A. SELSER,

Mar. 10. 10 Vine St., Philadelphia, Pa.

KANSAS CITY.—The demand for both comb and extracted honey is better, with receipts light. We quote as follows: Extra fancy, per case of 24 sections, \$3.40; strictly No. 1, \$3.30; No. 1 amber, \$3.00@3.25; No. 2 white and amber, \$2.50. Extracted white, per lb., 7; amber, 6@6½. Beeswax, 30.

C. C. CLEMONS & Co.,

Feb. 21. 306 Grand Ave., Kansas City, Mo.

SAN FRANCISCO.—Honey market as follows: Comb, per lb., 10@13. Extracted, water white, 7; light amber, 6@6½; dark amber, 5. Beeswax, per lb., 28 cts.

Mar. 1. E. H. SCHAEFFLE, Murphys, Cal.

FOR SALE.—1000 lbs. or more of extracted basswood honey, first quality, at 7½; also 1000 lbs. or more of amber slightly mixed with honey-dew, at 5c f. o. b. here.

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FOR SALE.—One barrel partly full (near 400 lbs.) of extracted honey mixed with honey-dew, but light color; good for feeding or factory purposes. Price 5½ cts. per lb.

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WANTED.—Beeswax; highest market price paid. Write for price list.

BACH, BECKER & Co., Chicago, Ill.

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1004 E. Washington St., Indianapolis, Ind.

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294, 296 Broadway, Milwaukee, Wis.

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Our Advertisers.

Read the advertisement of the Deming Co., Salem, Ohio, in another column of this paper.

Any one interested in quick and economical farm and garden work should obtain a copy of the Iron Age Book for 1903 by writing to the Bateman Mfg. Co., Box 120, Glenloch, N. J.

Our readers should see what the Ohio Carriage Mfg. Co., Station 27, Cincinnati, have to offer. Write them for prices and illustrations. They have a special bargain for GLEANINGS readers. Their adv. is on page 263, this issue.

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Objects of The Association:

To promote and protect the interests of its members.
To prevent the adulteration of honey.

Annual Membership, \$1.00.

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Special Offers. On all cash orders received before April 1st, 1903, we allow a discount of two per cent. To parties sending us an order for supplies amounting to \$10.00 or more at regular prices, we will make the following low rates on journals: *Gleanings in Bee Culture*, semi-monthly, one year, 50 cts.; *American Bee Journal*, weekly, one year, 70 cts.

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GLEANINGS

A JOURNAL DEVOTED
TO BEES,
AND HONEY,
AND HOME
INTERESTS.

BEECULTURE

ILLUSTRATED
SEMI-MONTHLY
Published by THE A. ROOT CO.,
\$1.00 PER YEAR MEDINA, OHIO

Vol. XXXI.

MAR. 15, 1903.

No. 6.



SHALL I be obliged to get a Spanish dictionary in order to understand any thing A. I. Root says, next time he comes to Marengo?

BASSWOOD-TREES are advertised, p. 209, "6x12 inches." Does that mean they're 6 inches high and 12 inches, through, or t'other way? [I give it up.—Ed.]

BRO. DOOLITTLE'S visitor, p. 186, asks, "Do I understand you to say that there is a lot of queens running about among the bees, at time of swarming?" and the reply is, "No, not that." But *isn't* there a lot running about at time of swarming, in those cases where a lot is found in an after-swarm?

SWEET CLOVER, p. 199, *seems* to be thrown out of the list that includes alfalfa, buckwheat, etc., and classed as fit only to be grown on waste land. Now you quit that, Mr. Editor. You know very well that in some places sweet clover holds up its head with alfalfa, and it is constantly growing in favor. [All right. I will include sweet clover.—Ed.]

HERE'S THE WAY it is given in a German-French bee journal: At the exposition in St. Louis, in the State of Colorado, in 1904, Mr. Swink, the largest owner of bees in America, will have 5,000,000 bees in 640 hives, and he intends to furnish them the necessary flowers for their harvest. [The editor of the German-French bee journal who compiled this remarkable statement possibly has only a smattering of English, and was unfortunate enough to mix fact and fiction together.—Ed.]

IN RESPONSE to your desire, Mr. Editor, to know what your readers want, let me say that, in the copy of GLEANINGS that you

send me, I'd like a fair proportion of questions and answers. Those who are more experienced than I may afford to skip them, but I never dare to skip one for fear there's something in it that I don't yet know. Then don't forget the pictures—and the footnotes. But if any footnotes get scattered in among these Straws, please let them be respectful. [All right; but if you put chips on your shoulder for me to knock off, I am likely to knock them off.—Ed.]

YOU ASK, Mr. Editor, referring to that tent business, p. 184, "But why shouldn't the workers get into the habit of getting into the tent as well as through the perforated metal?" For the same reason that the workers don't come into the tent where the drones do; because it isn't the *regular* entrance, and is opened only at set times when it is desired to have the virgins and drones fly. [But if it is open only at set times, why shouldn't a queen follow in the wake of the crowd of the workers, wasting her time in trying to get out at the regular entrance? And it is likely, if she fails at this entrance, that she will go to the one at the rear.—Ed.]

J. W. BALDWIN says, p. 199, that motherwort is not given in the A B C. Look again, friend Baldwin; it's there, in its proper place, between milk-vetch and mountain laurel. The editor wouldn't answer you whether feeding bees makes them lazy, but you needn't worry about that. You'll have to study up some pretty bad plan of feeding if you succeed in making them lazy. [But it is not true, doctor, that there is danger of feeding, when there is honey in the fields to such an extent as to make the bees actually lazy? that is, they look to the feeder rather than to the field. A. I. R. concluded, from an experiment that he conducted once, that he made one or two good colonies actually lazy right in the height of the honey-flow.—Ed.]

THAT \$921.60 in the treasury of the N. A. B. K. A. has a healthy look. [Whatever may be said of Mr. Secor's course, in the way of criticism, the fact stands out clear and strong that he has carefully husbanded the funds of the bee-keepers put into his

hands as a sacred trust. Whenever we have got into litigation of any sort, the fact that there was a thousand dollars in the treasury of the N. B. K. A., and the further fact that there were a thousand members who could, if necessary, pour in another thousand dollars, has had a tremendous influence on the minds of our enemies, the adulterator, and municipal authorities that were disposed to declare bees a nuisance. Mr. Secor has shown another good quality—an ability to keep still when “under fire.” Again, we might have had a General Manager who would not have turned over a single cent.—ED.]

THE *Leipziger Bienenzeitung* offers \$250 for an absolutely certain test for pure honey. [Any good chemist who has made the analysis of honey a specialty can determine nearly enough for all practical purposes whether honey is adulterated or not. Sometimes when the percentage of sugar syrup is very low it may be difficult to detect it; but the ordinary commercial glucose, such as is used in the United States, at least, is very readily discovered. The *average* chemist who has never had much to do with the analysis of honey, may make a mistake; but one who is at all familiar with the range of the proportions of the different properties or elements that go to make up ordinary honey can very readily show the spurious from the genuine; indeed, the courts of our land accept the statement of a reliable chemist. I do not know why the *Bienenzeitung* should feel under the necessity of offering \$250 for an absolutely certain test. If it desires a test that can be used by any bee-keeper, without a knowledge of chemistry, it might just as well make the offer ten times as large, and be perfectly sure of keeping the money.—ED.]

SOMETIMES bee-keepers will agree to market through certain avenues, and then take up with a better offer elsewhere, say you, Mr. Editor, p. 189. I have been under the impression that there was nothing disloyal in a member of a honey exchange selling outside at any time, providing he sold at a higher price. Am I wrong in that? [It all depends on what kind of contract is entered into with the organization of which the bee-keeper is a member. In the Colorado Association, one of the most successful organizations of its kind—perhaps the most so—the bee-keepers buy up a certain amount of stock, and I think the members are supposed to market their product through the organization. But suppose Mr. A, a member of the organization, does sell at a higher price; he does not break down the market, it is true; but should not his fellow-stockholders share in the better price he is able to secure in the slightly increased dividend that will be made later? If the bee-keepers are going to band together for mutual protection, they should be willing to give to the organization for the sake of what it may give them in return—a higher level of prices year after year.—ED.]

REPLYING to the question whether balled queens die from stings or suffocation, Dr. W. G. Sawyer, in *American Bee-keeper*, doubts the suffocation, because he found that, when he immersed drones completely in water for fifteen minutes, nine-tenths of them revived and were as lively as ever, and he thinks queens would not be so different from drones. I suspect he is right. Neither does the stinging theory seem tenable. If bees sting any thing, they're not likely to be two or three hours at it. My guess is starvation. [But haven't I seen stings lodged in the body of a balled queen? Yes, I am sure I have. But the fact that drones can be kept under water for so long a time, and still be revived, is a new fact. Wouldn't that also argue, rather, that the queen can get along for a considerable length of time with very little air? and is it not rather improbable that a ball of bees should be so tight as to exclude fresh supplies of air? If the queen smothers that way, why shouldn't several of the bees die also? We know a queen is more hardy than any of the workers—or at least the fraternity has generally held to that opinion.—ED.]

MR. EDITOR, after reading some things you say on p. 188, I'm just the least bit afraid that some of the beginners may expect that GLEANINGS is to take the place of a text-book. That should never be. If a beginner can't have both a bee-journal and a text-book, let him by all means start with the text-book, and then get GLEANINGS just as soon as he can get the money for it. When he has studied the A B C throughout, he is then in condition to profit by what he reads in GLEANINGS. But GLEANINGS is no place in which to answer which bees lay the eggs, how to form nuclei, nor any other of the things plainly told in the A B C. But in the faithful study of the A B C there will be some things the beginner can not fully understand, and GLEANINGS is the place in which to ask for clearer light; and after the contents of the A B C have been fully mastered there will still be plenty of things coming up all the time to ask questions about, and he should always feel free to ask them in GLEANINGS. [You have hit the nail squarely on the head; Mr. Beginner will, therefore, understand that the suggestion offered by Dr. Miller as to what GLEANINGS should be is a settled policy of its editors and publishers. We have always tried to make our journal supplement the book—not take the place of it.—ED.]

EDITOR HUTCHINSON thinks there ought to be some changes made in the N. B. K. A. constitution, and says: “In fact, one great source, if not *the* source, of most of our late troubles has been from a lack of definiteness in our constitution.” Perhaps. Undoubtedly there ought to be some change, but the question is whether it is best to try to make it so definite as to meet every possible emergency that may arise, or to rip out some of its present definiteness and depend a little

upon common sense. [I have for some time back held that we have too much constitution. It is impossible to prescribe a set of limitations in advance that will cover all conditions and circumstances that may arise in the future. I would be in favor of having less constitution, with broader powers delegated to a Board of Directors, of men selected for their fitness and wisdom, and who shall not be elected year after year, simply because the membership does not know who else to vote for. I would further favor having a nominating committee composed of three men who are familiar with the capabilities of the best men in the Association. That committee should propose a set of names, and let the membership select from that set. A Board of Directors composed of wise men having broad powers delegated to them could proceed along the lines of common sense and expediency rather than have to run up against an unconstitutional limitation. But the time to talk about this matter is not now, but some three or four months before the next election. I will endeavor to open the question if nobody else does at that time. In the mean time, let us make the best of circumstances, and get down to business.—ED.]

E. F. ATWATER, in *American Bee-keeper*, gives an explanation which is new to me, and is probably correct, as to the difference in the observations of Editor Root and myself concerning brood being built clear to the top-bar. He says: "Dr. Miller's frames are filled with combs built from full sheets of foundation stayed with splints; no sagging there; so brood is much more likely to extend to the top-bars. Root's combs are built from foundation stayed with horizontal wires, consequently sagging all along the top-bars, and bees dislike to rear brood in cells ever so slightly elongated." [When I first read this over it seemed like a reasonable and probable explanation; but I said I would go out into the honey-house and look over some hundreds of our combs, and I did. Well, I did not find one in a hundred that had elongated cells; and in a great majority of the combs the cells within one inch of the top-bar were exactly the same size as those four or five inches down; and yet by holding these combs up to the light I could easily see where the brood had been reared, by the darkened shading. In most cases it was two inches down from the top-bar. There is a little knack in wiring horizontally to prevent sagging of foundation. Wires must not be drawn too tight nor too loose. If you ask me to describe just how to get the right degree of tautness, I can only say this is a matter of feel. But, "allee samee," there is a tendency toward a light-weight foundation in the brood-nest; and ere many years roll by we expect to use foundation as light as super, in which case we shall be compelled to use splints or perpendicular wires, or, better still, perpendicular wires already incorporated in the foundation. The amount of brood in a brood-frame depends largely on the strain

of the queen. A little Syrian, Holy Land, Cyprian, or even black blood results in fuller frames of brood, I think. I suppose your bees are not as pure Italians as ours are, and this may account for the partial difference in the brood line.



Winter's reign at last is o'er;
He yields to Spring's mild sway;
Her scepter clothes the fields with green,
And strews with flowers our way.



The French have a very large apicultural literature, each journal seeming to be well supported, and filled with up-to-date articles. Without any attempt to describe them all separately, I give their names and addresses. If I were called on to name any one of them which I should think occupies the most prominent place it is Mr. Ed. Bertrand's *Revue Internationale*, Geneva, Switzerland. Mr. Bertrand's place as an editor and bee-man is such as to make him well known all over Europe. He was intimately associated with the elder Dadant up to the time of the death of the latter; and among the chief contributors to-day is Mr. C. P. Dadant, whose writings constitute a perennial charm for those interested in bees and who can read his articles in the French language.

Here are the names of the most of the other French bee journals:

Rucher Belge, Liege, Belgium. This is a splendid journal every way, both in contents and printing.

L'Abeille, Huy, Belgium. Very progressive.

Bulletin de la Societe d'Apiculture d'Alsace-Lorraine. Mundolsheim, Alsace, Germany. This is German and French.

Bulletin de la Societe de la Somme. Amiens, France.

Revue Eclectique. Sainte-Soline, France.

Gazette Apicole, Montfavet, France.

Progres Apicole. This is edited by Mr. S. Thibaut, of Mont-sur-Marchienne, Belgium. This journal is widely quoted, and occupies a high place.

L'Apiculteur, 28 Rue Serpente, Paris. This is a very old journal—the oldest I know any thing about, and a large one. Before Mr. Hamet's death it was a vigorous opponent of movable frames, favoring the old style of hives. It seems to have lost this peculiarity, and is a thoroughly good journal.

If any of our readers can make use of a bee journal in Danish, Dutch, or Bohemian I should be glad to hear from them.

In my list of German journals in the previous issue I overlooked *Bienen-Vater*, one of the best journals published in that tongue; also *Praktischer Wegweiser*, Oranienburg-Berlin, Prussia.

BEE-KEEPERS' REVIEW.

In the issue for February, Mr. R. L. Taylor has an article on foul brood, which is certainly worth all the journal costs a year. It is said of Mr. Taylor that he "holds foul brood at arms' length, and laughs at it;" hence it is likely he understands what he is writing about.

AMERICAN BEE JOURNAL.

Although I have not had much to say about the *Old Reliable* lately, it is not because it does not deserve it. Mr. York is not relaxing any of his efforts to make his journal indispensable to every bee-keeper. The high moral tone of the journal is very commendable. Mr. Hasty is always at his best here.



UNITING BEES IN SPRING.

"Good morning, Mr. Doolittle. Nice morning for the first of March."

"Yes, this is a nice morning, Mr. Smith. Soon be time for active work with the bees again. Think the few I have out may possibly fly a little before night. They will if it keeps still and clear as it is at present."

"The most of my colonies are coming out weak, I fear, and I came over to have a little chat with you about them. What shall I do to get the most comb honey and also a little increase?"

"Had you asked me this question some years ago I should have said, 'Unite these weak colonies as soon as possible in the spring;' but from later experience I will now say, leave each colony in its own hive till June."

"What has caused you to change your mind?"

"Later experience has proven to me that, where two or more colonies are so weak that they will not live till summer, if left in their own hive without reinforcing, they will not live through till summer if united, no matter if as many as half a dozen such colonies are put together. And I am not alone in thus thinking, for my experience has been the same as that of nearly all of those who have tried the same thing and reported in the matter."

"Deciding that it is not best to unite weak colonies in early spring, what shall be

done with them so I can secure comb honey from them?"

"After trying every thing recommended in our different books and papers, and not being pleased with any, I finally worked out the following after much study and practice. All colonies which are considered too weak to do good business alone are looked over, about the time pollen comes in freely from elm and soft maple, and each shut on as many combs as they have brood in, by means of a nicely adjusted division-board, so that the heat of the little colony may be economized as much as possible; and, also, seeing that each has the necessary amount of honey in these combs, or within easy reach, to last them at least three weeks."

"Why is it necessary to have so much food on hand?"

"If we would have brood-rearing go on rapidly in any colony in early spring, and especially in weak colonies, the bees must not feel poor in honey, nor have any desire to economize what they have. Such weak colonies can send only a few bees to the field for nectar, even when the flowers are yielding plentifully; hence, if we would make the most of our reduced colonies we must give them so much food that they are willing to use it extravagantly."

"How long should the colonies be kept shut up this way?"

"These colonies are to be kept shut up on these combs till they have filled them with brood clear down to the bottom corners, before more combs are added."

"Why is this necessary?"

"Because breeding will go on faster with the heat, and cluster kept in compact shape, than it would if both were spread out over more combs. In no case do we allow more than half the number of combs we use in our hives; and if any colony in early spring has brood in more than one-half of the combs, the same colony is good enough to take care of itself without confining it with division-boards."

"When these combs are all filled with brood, what then?"

"Then the stronger of these has a frame taken from it, taking the one having the most nearly mature brood in it, this frame being given to one of the next weaker colonies, or, say, to one which lacks one frame of having half that the hive will contain."

"Why don't you give this to the weakest?"

"That is the question I used to ask; but don't make this mistake, which many do, of giving this frame of brood to the very weakest, hoping to get it ahead faster. The answering of the question is this: The weather has not yet become steadily warm enough so but there is danger of losing the brood by chilling, as well as injuring the brood they may already have, should a cold spell occur, as I did several times while I was experimenting. By giving it to a colony nearly as strong as was the one from which it was taken, both are benefit-

ed, and both can furnish brood to another colony which is only a little weaker than the second, in a week or so. I think you see this part now."

"Yes, I do understand. But what about the colony from which you took the brood?"

"I now give this a comb quite well filled with honey, which is set in the place of the comb of brood taken. This stimulates this colony to greater activity, and causes the queen to fill this comb with eggs almost immediately, thus turning the honey into brood very rapidly. If the honey is sealed, the cappings to the cells should be broken, so as to cause the bees to remove it at once. This is best done by passing a knife flatwise over it, bearing on enough so as to mash down the sealing to the cells."

"What do you do next?"

"I keep working the brood from the very strongest down, step by step, as the bees advance and the season progresses, till the time the weakest colony (one having, say, only two combs filled with brood by this time) can take brood enough, without danger of chilling, to make it of equal strength with all."

"You now have all of the weakest colonies, which were shut up with division-boards, with five frames of brood—that is, supposing that your hive holds nine combs."

"Yes; and having them thus we are ready to unite, which should be done about two weeks before the honey-harvest comes, that the best results may be obtained."

"Please explain minutely about this uniting, so I may fully comprehend how it is done."

"To unite, go to No. 1 and look over the combs till you find the one the queen is on, when you will set it, queen, bees, and all, out of the hive, so as to make sure that you do not get the queen where you do not wish her, when you will take the rest of the combs, bees and all, to hive No. 2. After spreading out the combs in this hive, set those brought from No. 1 in each alternate space made by spreading the combs in No. 2, and close the hive."

"Why not set the combs in all together? It would be less work."

"The alternating of the frames is so that the bees will be all mixed up, and, thus mixed, they never quarrel, as each bee that touches another is a stranger. Bees often quarrel, and a lot are killed where no precautions are taken."

"Thank you for telling me this. Now what next?"

"The colonies are now allowed to stand thus for a few days till they are strong enough to enter the sections, when they are to be put on; and if your experience proves any thing like mine you will have a colony which will give as much comb honey as would that colony which was called 'the very best you ever had in the spring.' In this way you will have half as many colonies in excellent condition to work in the sections as you had weak colonies in the

spring; and if the season is at all good, you will secure a good yield of comb honey; while, had you united in the early spring, or tried to work each one separately, little if any surplus would have been the result, according to my experience."

"How about any increase?"

"These united colonies will be nearly as likely to increase by swarming as other colonies considered good in the spring. If you wish more increase than this, the comb with brood, bees, and queen, which are to be put back into hive No. 1, together with an empty frame and one partly filled with honey, can be built up to a fair-sized colony for wintering. This little colony will build straight worker comb for some time; and as soon as it ceases to do this, take the worker combs built by another colony just like it, and put them with No. 1 till the hive is full, and you have as nice a colony as you can get in any other way."



SIXTEEN extra pages this time.

THERE have been a number of good rains in California so far, but I am told, by those who know, that there have not been enough to insure a honey crop.

It has been very warm for the last week or so. I have been expecting the bees under the machine-shop to begin to "scold." Notwithstanding it is quite warm in their compartment, they are as quiet and peaceable as I ever saw them. But there are not so many bees in the cellar this spring as usual.

I HEREBY acknowledge my thanks to those who have so kindly written me regarding the general subject-matter of GLEANINGS. And, dear friends, while you are telling about the things you like, do not hesitate to speak about the things you don't like. A little honest criticism is often more helpful than praise.

SHALLOW BROOD-CHAMBERS AND THE 4×5 SECTIONS.

In the *American Bee Journal* for March 12, Mr. R. C. Aikin, of Loveland, Col, advocates an elastic double-brood-chamber hive suitable for accommodating 4×5 sections. It is surprising how many of the progressive bee-keepers are turning their thoughts in that direction. At the last Chicago Northwestern, 4×5 sections received quite a favorable mention. As time

goes on, it comes more and more into prominence. It started first in the East, and is now gradually working westward. It was Capt. J. E. Hetherington who first introduced this section, or what was practically the same thing, $\frac{3}{8} \times 5$, I think, at the Centennial at Philadelphia in 1876.

FORMALDEHYDE AS A CURE FOR FOUL BROOD.

SOME two or three issues ago, Mr. Weber, of Cincinnati, told of a very interesting and satisfactory experiment showing how he thoroughly disinfected combs affected with foul brood. At that time I requested him to keep us posted in regard to his further experiments. In a letter just received, he writes:

Mr. Root:—Fulfilling my promise made you some time ago, to inform you of any future developments regarding the cure of foul brood by means of formalin gas, I now hand you the final report of Prof. Guyer, of the University of Cincinnati. The combs mentioned in his report were sent to me to experiment with, by friend bee-keepers. After fumigating them I sent them to the professor, with the request that he endeavor to find signs of life; but, as he says, he could not. Following is his report:

Seventy-five tests for foul brood in bee-comb. Tests were as follows: 40 tests on comb which had been subjected to formaldehyde-culture, medium-agar at 37°C; 10 tests on comb containing honey treated as above; 15 tests on comb as above culture, medium boriellon at 37°C; 10 tests on comb (foul brood) not treated with formaldehyde. *Bacillus alvei* (germ of foul brood) was found in the comb not subjected to formaldehyde; none was found in the combs which had been treated with formaldehyde.

This establishes beyond a doubt that formalin gas is a sure cure for foul brood; and I hope that bee-keepers who are unfortunate enough to have colonies afflicted with this disease will give the new cure a trial. I will cheerfully furnish directions, etc., to any one upon request.

C. H. W. WEBER.

Cincinnati, Ohio.

I do not feel so certain myself that formalin gas is an absolutely sure cure; but the experiments thus far conducted by Mr. Weber give us great reason for hoping that we have something here of more than ordinary value. If we can treat diseased combs by so simple a plan as this, we can wipe foul brood out of a yard with very little expense or trouble. Yes, by all means, Mr. Weber, tell us the exact process by which you succeed in disinfecting the combs above mentioned. If you will furnish us the directions, it will save you writing, perhaps, hundreds of letters.

FOUL-BROOD BILLS BEFORE THE VARIOUS STATE LEGISLATURES.

FOUL-BROOD bills are now in the hoppers of several of our States and Territories. Our bee-keeping friends are hereby notified that it will take an unusual amount of pressure to get the bills through both Houses, as there is always some Senator and Representative who has some pet measure of his own that he desires to have put forward; and when there is a lot of such fellows, each with a pet measure, a foul-brood bill is liable to go by default simply because it is crowded out. A foul-brood bill is now before the legislature of Texas which requires the owners of bees to report in case

of foul brood, or other contagious diseases, to the State Entomologist. The measure is weak, it seems to me, because it provides no penalty on the owner of the bees for not complying with the order. But the entomologist may burn the bees.

There is another foul-brood bill before the Maine and Illinois State Legislatures, and one has lately passed in California, and is now a law. Keep up the pressure all along the line.

CARPET GRASS, OR *LIPPIA NODIFLORA*.

ONE of our correspondents, Mr. H. M. Jameson, of Corona, Cal., calls our attention to the fact that Bulletin No. 45, issued by the Agricultural Experiment Station of Arizona, published at Tucson, has something to say about this wonderful honey-plant; but, strangely enough, it says nothing about the fact that it yields honey; but it gives prominence to the fact of its making a good binder to the soil; that it is found on both hemispheres, and extends north from the South American tropics to Central America, Mexico, and into California, Texas, and the South-Atlantic States. Prof. Thorner, the writer, says, "Recent observations indicate that *Lippia nodiflora* can maintain a continuous layer of green, with a less amount of water, than any other desirable plant in our borders." It is not a forage-plant, he explains, as "grazing animals entertain a dislike for it;" and for this reason it is all the more valuable as a sand and soil binder. In sandy regions, with a limited amount of water, or in the case of embankments where it is desired to hold them together, and not let the water run over the banks, on cultivated lands, it has no equal. It can be propagated very readily from cuttings.

In the region of Nicolaus, Cal., as I have before explained, it is one of the most valuable honey-plants known. The gold-washings in that vicinity have destroyed the soil, killing out alfalfa; but along the dikes or embankments to prevent the further overflow of the river, destroying more land, this beautiful carpet grass forms a soft, thick, bedlike mat. It is springy to the feet; and when one lies down on it he almost feels as if he were buoyed up by a brand-new hair mattress. I was fortunate enough to be present when bees were working on it. The tiny blossoms were covered by them. Not only do bees work on it, but they carry in large quantities of honey—tons of it—yes, carloads of it—of a beautifully flavored thick white honey that will rank with any mountain sage in any part of California.

This carpet grass, or *Lippia nodiflora*, would be a most wonderful acquisition to Florida, if once introduced; and this leads me to say that the Arizona Agricultural Station, Tucson, "will endeavor to furnish *Lippia nodiflora* in limited quantities to all who may apply. When received it should be planted immediately in rows one or two feet apart, in well-watered and well-prepared soil." After the plant is once well

started, cuttings can be taken off, and it can be further propagated. When a firm stand has been secured, they may then be transplanted to washes and other similar situations where it may be desired to hold the soil together.

If the plant is valuable as a soil-binder, the bee-keepers all over the world should make an effort to get it introduced in their localities, not necessarily because it is a soil-binder, but because of the great amount of fine honey; and when once introduced it will stick like many other creeping plants of its kind.

Further particulars can probably be gathered from Prof. J. J. Thorner, of the Department of Botany, of that Territory. Whether or not bee-keepers and others outside of Arizona would be furnished these cuttings free I can not say; but probably some will be supplied to all who apply for it, at a nominal cost.

"FORTY YEARS AMONG THE BEES."

In our last issue I promised to tell you more about this new and interesting book by Dr. C. C. Miller. I have read page after page of it; and the more I read, the more I am convinced that it is one of the most practical books that was ever written. There are 101—yes, 1001—little kinks, little tricks of the trade, little ideas, and big ones too, which, while they may be old to some of the veterans, I am of the opinion will prove to be new and useful to the majority of them. The doctor has crowded into these 330 pages his ripest experience; and not only that, he has drawn from the ideas of others so that we have the very latest and best in the way of practical information from one who has actually spent "forty years among the bees."

In our previous issue I spoke of the fact that the writers of text-books, and editors of papers, often assume too much knowledge on the part of the one they are supposed to instruct. Our author, while he is not writing for beginners, does not assume any thing of the sort. He describes just what *he* does in the bee-yard, and *how* he does it. Even in the simple matter of catching a queen, he goes into full details, illustrating by photograph each step in the operation. And that reminds me that, some four or five years ago, I told the doctor he ought to get one of those little pocket kodaks; that one who wrote as much as he did ought to be able once in a while to give a picture of the *modus operandi*. The next thing I knew he had bought him a little camera, and was snapping it on every thing right and left. Why, you just ought to see how he illustrates in his books his various manipulations with that handy little instrument. Take, for example, his method of getting bees off the combs, as shown in Fig. 26, p. 83. Without the book itself I can not describe to you exactly the vigorous shake or "shook" he gives a comb; but with his left hand he grabs the end-bar securely; then with his right hand, or fist, rather, he comes

down on the back of his left hand, holding the frame, with a quick sharp blow. Why, you can actually see Dr. Miller's chubby fist knocking every bee *clean off*. Did you ever try to shake a comb with two hands, giving it the most vigorous kind of "shook," but it would not "shook" *all* the bees off unless they were black ones? Well, take Dr. Miller's plan, and, presto! every bee will drop *instantly*. In Fig. 28 he shows the art of sweeping bees off the comb; in Fig. 31 how he stays up his foundation with wooden splints, and a good plan it is too.

Again, we get a glimpse of the doctor holding his Miller feeder, just as if he were describing its merits before a convention. Another view that is most interesting is the drive leading up to the Miller mansion. On one side of the road is a row of beautiful lindens, making the view from a purely artistic point very attractive. Fig. 29 shows the sealed brood of laying workers; and it is the best representation in printer's ink of such brood I have ever seen. Fig. 60 is a remarkable view of a section filled with foundation—one large top starter and one narrow bottom starter.

In Fig. 61 we see the doctor in his light summer clothing, trimming foundation up for sections. Yes, we can almost see the sweat rolling down his good-natured face. In Fig. 83 we are forcibly reminded of the fact that the doctor believes in cool dress for summer work among the bees. One thickness of clothing, bee-veil, and hat, shoes and stockings, complete his regalia, and he looks very neat and comfortable standing up among his favorite rose-bushes. In Fig. 84, again, we see Miss Wilson, his sister-in-law, in her very neat bee-suit. Well, I might go on and describe each of the 101 pictures that are so interesting and also instructive.

Yes, the book is full of good things—packed full of them, and I question very much whether *any* progressive bee-keeper, beginner or veteran, can afford not to read this book clear through. You may say you have read the doctor's writings for years. Granted. But you will find that there are many little kinks that he describes in this book, that he has never put on the pages of a bee-journal—not because he was not willing to impart what he knew; but because, when he sat down to write a book, one thing after another suggested itself until he unfolded a new story that is as good as a story and far more profitable.

The price of this book is \$1.00, postpaid. We will club it with GLEANINGS, both for \$1 75.

VENTILATION IN BEE-CELLARS; HIGH TEMPERATURE; MESSRS. DOOLITTLE'S AND BARBER'S BEE-CELLARS.

In the *Bee-keepers' Review* for February appears an article from Ira Barber on this subject. Mr. Barber has been an advocate of high temperature in bee-cellars, and has insisted that one of the chief requirements for successful wintering is to keep out sup-

plies of fresh air from the outside. From that article I make several extracts which will speak for themselves:

* When I was in the habit of airing my bees in winter quarters, they did all of their roaring in the cellar; but when they got to their stands in the spring there was no roar left, for there would not be enough bees left to get up a good respectable roar. After I learned that bees would winter nicely with what air was in the cellar, and what naturally finds its way there, I found my bees did their roaring on the wing; and 75 or 80 per cent. of them were ready for the sections when sent out. * * * * *

I should like to have Dr. Miller, and several others who are in the habit of airing their bees, agree to test this way of wintering, and see for themselves how strong and healthy their bees will come out. Don't be alarmed if they do roar, for they are always happy, as a rule, when they roar the loudest. * * *

I have wintered them so hot they could not stay in the hives, but would be all in a mass together, yet they came out the strongest lot I ever saw. No fresh air was allowed to reach them in that condition.

In case a man has only a few colonies they will winter fairly well in almost any cellar; and, of course, would not raise the temperature of the cellar so as to require any special attention; if it did not freeze, the bees would be all right.

It is where large numbers are kept together, that fresh air is so demoralizing to them.

Then a little further on, referring to myself, he says:

I hope that if E. R. Root comes up into this State next summer he will come on to this locality, where some of the largest bee-keepers of the State are to be found, and where all use large hives, and where all winter the bees in cellars as I have described.

If circumstances had been so I could have gotten away, I certainly would have taken a run up to Mr. Barber's cellar, and incidentally stopped off to see Doolittle's. I will try to do so next winter.

Our own experience shows that the bees in a cellar without ventilation, especially where the temperature can not be controlled, is disastrous to the bees. They roar, fly out on the cellar bottom, and die in large numbers; and roaring with us seems to presage no good.

Last year we had something over 200 colonies in one of the compartments of our shop cellar. On the floor above there was heavy machinery in motion, with the occasional dropping of heavy castings, and yet the bees wintered well, and are now doing so again this winter.

In February, of last year, when it began to warm up outside, the temperature in the cellar began to rise. The bees became uneasy, flew out on the cellar bottom, and it was evident that the loss would be considerable. We picked out one warm day, and set a part of the bees out for a flight. After a good cleansing they were returned toward night. That lot of the bees became immediately quiet, but the other portion roared as before. These were set out on another day, and returned, when they also ceased their roaring. Previous to this when we found the bees would become uneasy we could quiet them down by giving them ventilation at night, closing the doors before morning. This had the effect of neither increasing nor decreasing the temperature; but it *did purify the air*.

This winter we put in only 40 colonies where formerly we had 200; and at this date, March 10, there are not enough dead

bees on the floor to fill a two-quart pan; and those that are on the floor are as dry as though they had been dead for some time. We have not had to ventilate, for the simple reason that the compartment is large for the number of bees confined; and it may not be necessary to give them a winter flight.

Now, my own theory of the matter is this: That a lack of pure air causes the bees to become uneasy and hence active. They consume their stores, as a matter of course clogging the intestines. This makes them *still more uneasy*. When they are restless from this cause, nothing but a flight will quiet them; but when they are restless from want of pure air, a supply of it makes them immediately contented and quiet.

The accompanying letter, received from one of our correspondents, you will notice is along the same line:

I wish to add my testimony in regard to ventilating a bee cellar, and in taking bees out for a flight and returning them to the cellar. I use a part of my house-cellar partitioned off with matched boards. The temperature keeps between 38 and 41 degrees, with but little variation; air is rather damp, but I have a cement floor, and cellar is mouse-proof.

The winter of 1901 being the first I had tried, as I was afraid the cellar was too cold and damp, I put six colonies in for experiment. In March they were making more noise than earlier in the winter, causing me much anxiety; so when we had a warm day about the middle of the month, I set them out. They had a good fly, cleaned the hives of dead bees, etc.; were carried back in the evening, and were very quiet till they were set out for good a month later.

From what I have read since, I do not think they had become so uneasy as to cause a veteran to worry; but I think it did them good, for afterward during the whole month they were very quiet—as quiet as when first put in, and all came out well in the spring.

This winter I have eleven colonies in the cellar; have taken more pains to ventilate, and up to the present time (Feb. 22) they are very quiet—more so than those were last year. I have 46 colonies out of doors, packed in planer-shavings.

CHAS. S. BLAKE.

Ashby, Mass., Feb. 22.

I do not presume to contradict so good an authority as Mr. Doolittle or Mr. Barber; but I firmly believe that, in the average cellar, and with the average bee-keeper, he will do better to ventilate occasionally, and perhaps set the bees out some warm day for a flight. A plan of procedure that will work well with experts like Mr. Doolittle or Mr. Barber might prove disastrous with the average bee-keeper. Mr. Doolittle has a cellar that will maintain the temperature absolutely within half a degree. This makes, no doubt, a modifying condition, rendering it unnecessary for him to give his bees any other ventilation than what would percolate through the cellar doors or walls. The absolutely uniform temperature keeps the bees quiet, or in a state of quiet and sleep, where the activity, and consumption of stores, are kept down to the lowest point possible; hence little ventilation is needed. But now comes our friend Mr. Barber, insisting that temperature is not essential, and that they must have no fresh air.

Another winter, if my health and time will permit, I hope to see that cellar, to determine, if possible, why his experience and ours should be so diametrically opposite to each other.



PRIDGEN ON QUEEN-REARING.

Pridgen's Queen-rearing Tenement Hive; the Detail of Its Construction.

BY W. A. PRIDGEN.

[Some time ago, as our readers will remember, Mr. W. H. Pridgen began a series of articles detailing his system of queen-rearing which had attracted some attention in the bee-journals. In the mean time, lack of time, and a desire on his part to test some new devices which he thought might prove superior to those he had been using, induced him to drop the matter for the time being. He has since had an opportunity to test these new things, and has now placed in our hands the manuscript to complete the entire series. The initial article of the new series is begun with this issue.]

It will be noted that he uses a sort of queen-rearing tenement hive of special design - one that stands up on legs at a convenient working distance. In fact, this whole hive is so constructed as to enable him to throw one or more brood-nests together; to change the entrance from front to rear; to unite, and perform many necessary operations for the rearing of queens. In order to understand the description the reader should first study all the engravings, getting as fair an idea as possible of the detail of the hive before he takes up the general description. Without any preliminaries, Mr. Pridgen plunges into his subject as follows:]

This hive is especially constructed to overcome the perplexing manipulations necessary with ordinary hives in preparing bees for cell-building, to accept cups, etc. It has been in practical use for two seasons, and meets all of the requirements under all conditions. It can be used as one mammoth hive of six times the ordinary size, and contains anywhere from one to six virgin or laying queens, or some of both; or in a few minutes it can be changed to any desired number of distinct hives up to six, and each contain a normal colony of bees.

Any portion made queenless can be worked as a queenless colony, or communication can be given through queen-excluding zinc to an adjoining apartment containing a queen, thus giving one complete control of the situation.

A study of the illustrations, all of which are of the same hive, will give one a pretty correct idea of its construction, and better enable him to understand the cause and effect of the different manipulations.

As shown in Fig. 1, with every thing intact it forms six distinct hives, with no communication from one to another, in which the bees winter better than in ordinary single-walled hives, as each colony is benefited more or less by the warmth of the others. When the time arrives to commence queen-rearing operations, instead of drawing brood and bees from other colonies to prepare one over an excluder and laying queen, in the ordinary way, it is only necessary to

remove a queen and work the bees as queenless, or give communication to an adjoining apartment, and work them as is the case over an excluder.

In this way queens can be removed, and communication given from one apartment to another, according to the wishes of the operator, until all but one or two queens are

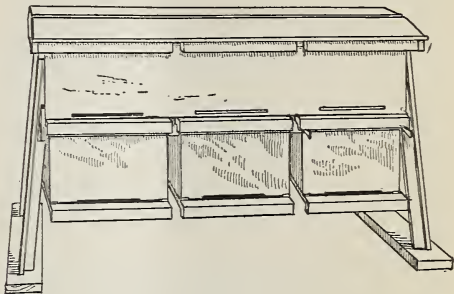


FIG. 1.

removed, and communication is given from one apartment to another throughout. When this stage is reached, three or four batches of cells in different stages of development can be kept in the hive all the time.

Each apartment has two entrances *at each end*, the hive being alike on both sides, with only a sheet of zinc between them, one being below and the other immediately above it, all of which are closed, except those actually needed, by means of plugs cut to fit them.

In this way drones or queens may be allowed to fly from certain apartments, or prevent their flying at will, besides being able to change entrances from one end to another of certain apartments from time to time, for reasons that will present themselves.

When arranged for winter, the center apartment in top tier, and two end ones in

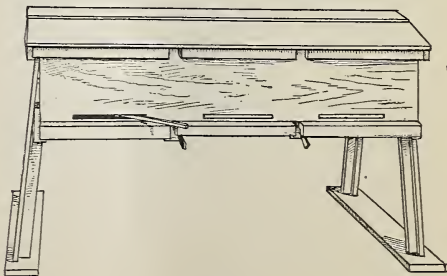


FIG. 2.

bottom tier, are given entrances on one side, and the order reversed for the other three on the opposite side, which gives ample room between them to prevent the mixing and fighting of the bees after they have been separated in the fall and become distinct colonies.

In making the test, the idea was to carry the experiment far enough to see if a num-

ber of queens could be worked with communication from one apartment to another, by having two excluders (with at least a bee-space between them) at each division, and nothing has transpired to prove that a greater number than has yet been tried would not work in perfect harmony under these conditions, though what effect an insufficient supply of stores might have is not known.

To make a perfect queen-rearing hive, which is the main idea in the one herewith illustrated, the bottom hives, as shown in Fig. 1, are not at all essential. They only serve the purpose of furnishing more apartments, while it would be just as easy to build them all side by side, as shown in Fig. 2, and thus be able to get at the inside by simply removing the covers instead of having to slide them out as drawers, as shown in Fig. 3.

Fig. 2 shows the hive with these left off, the covers to these bottom hives being used as bottom-boards for the top chambers.

As will be seen in Fig. 3, this is divided into three apartments by two tight-fitting division-boards at each partition, with a space of $\frac{3}{4}$ inch between them, from within two inches of the bottom up.

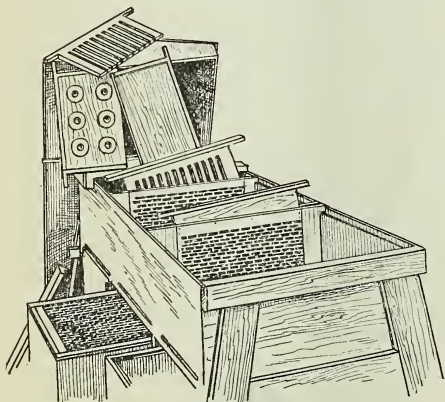


FIG. 3.

The boards on which the bottom hives are suspended extend up between these division-boards two inches, and all are securely nailed. They also extend below three inches, and have small strips nailed to the lower edges on which corresponding strips nailed to the sides, at the tops of the hives, shown suspended in Fig. 1, rest while being inserted or withdrawn, as an ordinary money-drawer found in the stores, except that they are not made close-fitting up and down, but, instead, there is a space of $1\frac{1}{2}$ inches between in which to add queen-excluders or solid boards, as the case may require, between the upper and lower stories, and still admit of some wedging-up.

The two end-boards that support the lower hives are nailed to the ends of the main hive, which can be seen in the picture; and, while only two wedges are shown, still it

takes four to each hive suspended (one at each corner), and whether or not there is an excluder placed between to double the excluders between upper and lower stores (there being one made fast in the bottom of each chamber), or a solid board to cut off communication be placed between, still there must be at least a half-inch additional space allowed for wedging up, as close-fitting slides will not work well when gummed with propolis, saying nothing of the certainty of crushing bees by their use.

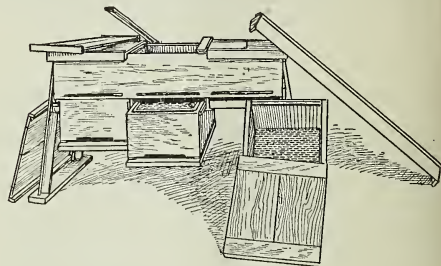


FIG. 4.

When the wedges are withdrawn at one end of a chamber it is allowed to settle slowly without a snap or sudden jar, which, when repeated at the other end, allows the rests or flanges to come together, and the hive is ready for withdrawal endwise, which is easily done without crushing a bee.

When it is ready to be returned, simply slide it under and wedge it up to a tight fit.

Fig. 4 shows one bottom hive wedged up without a cover or excluder; another partly withdrawn with an excluder over it, while the third one is withdrawn and shows the queen-excluder in the bottom, which is a bee-space above the main bottom, both being securely nailed. It also shows covers to the different upper apartments, one being removed, as well as the narrow strips that fit between them, and cover the spaces between the double partitions shown in Fig. 3.

By removing these narrow covers, the different division-boards, etc., shown in Fig. 3 can be removed or adjusted without opening a single chamber, one of which is shown elevated while the other is in place.

As elsewhere referred to, the partitions as shown in Fig. 3 are double walls with a $\frac{3}{4}$ -inch space between except within two inches of the bottom, where they come into contact with and are nailed to the boards to which the bottom hives are suspended. The openings in the partitions forming the passages from one chamber to another are 5×10 inches, and neither reaches the ends, bottom, or top, over which the zinc is nailed on the sides next to the brood-chambers, which leaves a space as wide as the different boards used in making the partitions are thick, between the zinc and the solid division-boards used to cut off communication between the different chambers.

In Fig. 3 is shown one of these boards

partly inserted, while the other one, leaning against the main cover to the whole hive, shows strips nailed across the ends.

These strips fit against one partition wall while the smooth side of the board covers the opening in the other, but does not reach the bottom of the space between the walls, which allows any bees to escape that may be in the space at the time the board is inserted.

The one with the rings, which are bee-escapes, fits the same way, the escapes being used when cells are being built by bees made queenless to supply additional force from brood and laying queen to the cell-builders, while those made of bars, one of which is also partly inserted, are bridges to assist the bees in passing from one chamber to another when communication is given, and also to prevent the filling of the spaces with comb.

Double zincs are wanted everywhere to prevent attempts of attacks by queens in adjoining apartments, when communication is allowed between two or more having queens, as well as to insure more satisfactory work in cell-building, and hence the necessity of double zincs in these partitions as well as between upper and lower stories under similar circumstances.

The entrances at each end of every chamber, below the queen-excluding sheets of zinc, are the full width of the chambers, while those above them are only about two-thirds of their width, the most of which are shown plugged up in the pictures.

The necessity of so many can be better understood when the point of manipulation is reached.

One of the very necessary things not shown in the illustrations is the provision for feeding without opening the hive. For instance, the two sectional covers shown in place, on Fig. 4, have holes near the corners, to correspond with the holes bored into the top-bars of Doolittle feeders, through which the latter are filled, wire-cloth cones being attached to the holes in the covers, that extend down into those in the feeders, through which feeding is done, and not a bee can escape, a piece of section or small block being used as a cover for the hole in each one.

While the above descriptions do not cover all of the little details, yet no doubt with the pictures as helps, and an understanding of the objects in view, any one with a mechanical turn of mind can construct a hive embodying the same principles, and that will work in a satisfactory manner.

[In the subsequent articles Mr. Pridgen will tell something about his methods; how he gets drones out of season; how he succeeds in rearing good queens after the honey-flow; how, in short, he is enabled to overcome many of the obstacles that present themselves, either to the queen-rearer or to the practical bee-keeper who desires to rear a few queens from some good stock he happens to have in his yard.—ED.]

FORCED SWARMS.

A Note of Warning; the Practice of Using Starters "Pernicious in the Extreme;" Full Sheets of Combs Advocated.

BY W. K. MORRISON.

My experience with brushed swarms has been considerable and satisfactory, but I wish to warn some of your readers against one or two errors in connection with this practice, with particular reference to tropical bee-keeping.

First, it has been proposed to use "starters" of foundation when hiving the brushed swarms—a practice which I feel justified in stating is pernicious in the extreme. I know of no one error that afflicts tropical bee-masters more than this bad habit of putting bees to work in a brood-chamber fitted out with starters. Times almost without number I have seen the folly of it, hence I feel like uttering a note of warning. It has often pained me to see large masses of brood-comb occupied with drone-cells—a sheer waste. This is invariably due to the use of "starters." The man who uses starters, instead of producing large yields of honey has large numbers of drones flying about which eat the honey as fast as the busy bees can collect it. The beginners particularly should never on any account use starters, no matter what the text-books may say.

If combs are not available, use full sheets of foundation. If the bees are troublesome, and will not enter the sections, use a shallower frame. Either the Ideal or the Dandenbaker will answer. Anything is better than starters. There is another serious objection to starters. The queen is restricted for room to lay her eggs. This is something serious, as the swarm rapidly dwindles in size, and after a lapse of four weeks becomes weak, and usually makes no headway after that. The main advantage in brush swarming is in providing the queen with plenty of room to lay in bright clean combs having neither brood, honey, nor pollen in them. Such a colony never dwindles, for the obvious reason that plenty of young bees are coming forward the while to take the place of workers dying in the harvest-field. If combs are given to the newly formed swarm it is evident the queen will not attempt to go upstairs where there is only foundation. Where full sheets are used it is better to wait 24 to 48 hours before putting on the sections to allow the queen to settle herself in the brood-chamber. It stands to reason that, if the bees have no combs to build below, they will all the more readily build the sections above, as they are anxious to build combs. *But it simplifies matters very much if a shallow brood-chamber is used.* At the same time it is bad policy to use a brood-chamber that is too small. The Ideal is quite small enough.

I believe in large hives to get large yields, and had Mr. Dadant advocated a hive composed of three stories the same size as his

extracting-super I would have agreed with him in toto. It takes lots of bees to produce lots of honey; and except in peculiar localities it pays to keep the queen laying to her greatest capacity all through the honey period. Particularly is this true of the tropics and warm countries generally, where the season extends through several months.

Clogging of the brood-chamber with honey and pollen is the stumbling-block of the tropical apiarist, and brush swarming is one method of overcoming this. As soon as it appears that the hive has become congested, brush swarming is in order, as it gives the colony a fresh start in life, and also gives the apiarist a chance to deal with the combs that are left behind. The latter are better if placed over another colony where the pollen is removed, the brood hatched, and honey stored in their place. It is no use at all to brush-swarm small colonies. The honey is extracted in due season, when the apiarist again has fresh clean combs fit for any purpose.

There is no doubt at all that brush swarming is an effective way of controlling increase; but it seems to me the person who brush-swarms a colony only to give it "starters" has committed a very grave error, to say the least. He has lost all or nearly all the advantages of our modern hives, for the bees will certainly build one-fourth to one-fifth of their comb with drone-cells, and no apiarist can stand such a steady loss. If the bees must be *compelled* to enter the section, some other way must be found rather than use these "starters." Better use plenty of "baits" if the frame used is the Langstroth. Drawn combs are great drawers. This may appear to be a sort of advertisement for the makers of comb foundation. So it is, in a sense; but from my own experience I feel so strongly about it that no stone should be left unturned to help dissipate the fallacy of using starters in a brood-chamber.

It is natural that persons should desire to save expense in equipping their hives; but so far I have noticed the most successful bee-keepers use full sheets of foundation right through their apiaries, and they are wise.

[The practice of using starters or full sheets is one that depends somewhat on locality, though Mr. Morrison seems to give good proof showing that it is bad policy to use starters *anywhere*. I should be glad to see this phase of the question discussed a little more.—ED.]

BEE-KEEPING IN CUBA.

BY E. M. DAVIDSON, M. D.

Mr. Root.—It might be of interest to the readers of GLEANINGS to hear from co-workers in the honey industry down here in "the Pearl of the Antilles." Others of American blood and American bee-knowledge have invaded the western part of Cu-

ba with their busy bees; but we wish it known that in this, the first American colony in Cuba, La Gloria, the industry in nectar-gathering has made rapid progress, and we claim for this spot on the northern coast of Cuba, not an ideal bee paradise, but nevertheless a paradise as compared with many a place in the States where the problem of successful wintering is such a great one. Ordinarily one of our greatest honey-flows comes in December; but the rainy season coming on late, instead of in July, has interfered considerably with honey storage in supers.

We have organized a fairly strong bee-keepers' association here, and with many members who are real students, and some up-to-date bee-keepers of some standing. Officers of said association are: President, J. Hammond; Vice-president, James Robinson; Dr. E. M. Davidson, Secretary. We shall represent thousands of colonies in time, for possibly we can get the Cuban bee-keepers here interested in the American way, and transfer from their log hives to American ones; and we may bring them under the control of our association.

All along the north slope of the De Cubitas Mountains can be found the Cuban log hives, running now mainly for wax. The Cuban bees are the black German; but our association members are rapidly obtaining the Italian from United States queens.

Our aim in organization will be to obtain membership in the United States National Bee-keepers' Association; and we hope to gain admission to the United States National Honey-producers' Exchange if one is formed. We are praying for this as fervently as we pray for our island to be annexed to the glorious Union of the States. You may hear from us and Cuban conditions from time to time.

Root's goods predominate in this section; but we should be glad to have a depot of goods on hand to draw from at will for cash.

We all deplore the sad death of Rambler. His slate is indeed broken beyond repair.

Mr. A. I. Root is on the island, and he would be welcome to La Gloria if he would only come this way.

La Gloria, Cuba.

[Many thanks, friend D., for your kind invitation. I only regret that it did not get into my hands before I left Cuba. To tell the truth, I did not carry with me a list of our Cuban subscribers; but when I go again next fall, as I expect to do, I shall most assuredly hunt you all up. I have already stirred up the bee-keepers west of Havana to the importance of a bee-keepers' convention to be held once or twice a year or often-er. I know many of them plead lack of time and the expense of travel in Cuba; but I judge, from my own observation, that if bee-keepers would get together and talk things over, there is hardly one of them that would not be benefited, say to the extent of \$25 a year, by such a conference. I am exceedingly glad to know you have made a start.—A. I. R.]

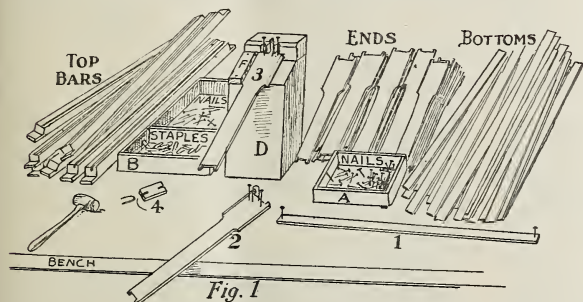
NAILING HOFFMAN FRAMES.

A Very Unique and Effective Plan for Doing the Work Expeditiously.

BY C. B. THWING.

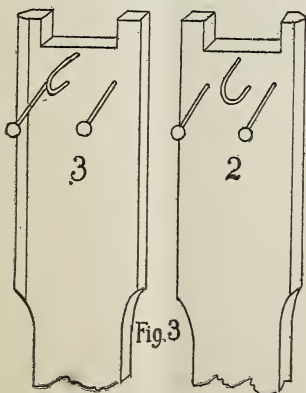
Having 3000 Hoffman frames to nail, it occurred to me to try to devise means for doing the work as rapidly as possible. The plan I evolved enables me to nail and wire Hoffman frames at the rate of 30 per hour (when I move lively), and every nail and staple goes exactly where it will do the most good.

It is, of course, important to have the materials conveniently placed, and to perform



THWING'S PLAN FOR NAILING HOFFMAN FRAMES.

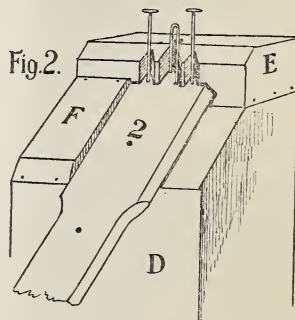
the various operations in such an order that no false motions be made. Fig. 1, general view, shows how I find it convenient to place things. The nail-boxes should be wide and shallow, with nails spread out



over the bottom. It saves time to have two boxes for second nails, as shown. The wooden anvil or holder D in Figs. 1 and 2, for spacing the nails and staples, consists of a block 4x4 and 7 high, to which is fastened a block, E, notched out on its under side to admit an end-bar only when the beveled edge is toward the right. It has in the middle a large notch for the staples, and two smaller ones for the nails. A stop or guide on the under side of E admits the end-bar far enough so that the top of the

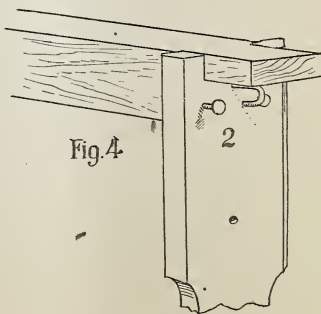
staple comes $\frac{3}{8}$ inch from the notch in the end-bar, and the nails $\frac{1}{4}$ from the same line. The nails are $\frac{3}{4}$ inch apart. Guide F holds the end-bar square. I prefer to have the staple placed at an angle, because its lower leg will then strike the top-bar to one side of the foundation groove, and also because it is less likely to split the end-bar, when so placed, than when set straight.

For wiring I fasten a small box, G, see Fig. 6, about 12x16, to the wall, with its bottom as high as my breast. Into the side of the bottom of this box I drive two 10d common nails, slanting a little downward. The nails project far enough so that, when a



THE WOODEN ANVIL OR SPACING-BLOCK.

frame is hung upon them the heads hold it snug against the box. The slant of the nails lets them spring down a little when the button H is turned down upon the frame. On the end of the box G, Fig. 6, at the left, is screwed a notched piece J, Fig. 5, which keeps the frame from slipping endwise. A little box, K, Fig. 6, exactly wide enough to hold a spool of wire, is placed $4\frac{1}{2}$ feet from the nearest end of G. The wire runs through a small hole in the end of this box, and the blocks LL prevent the wire from slipping over the ends of the spool. The best driver is a small-nosed farrier's or electrician's hammer.



TO NAIL A FRAME.

Take a bottom-bar, 1, Fig. 1, from the pile; start the nails and let it lie till needed. Take an end-bar, 2, in Fig. 1, from the pile; slip it in the anvil D, Fig. 2; pick up a staple with the left hand; pass it to the

finger and thumb of the right hand, which holds the hammer about the middle of the handle. With the right hand set the staple in place against the right side of the central notch; hold it in place with the left thumb, which rests against the beveled corner of E, Fig. 2, and comes flush with its top. Set the nails in the same way, the

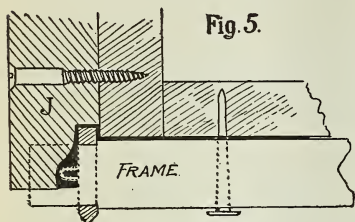


Fig. 5.

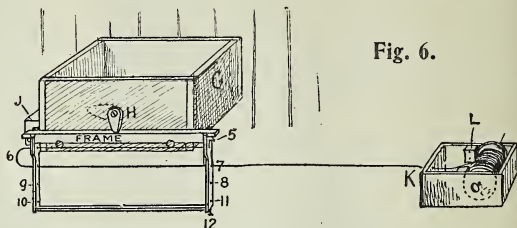


Fig. 6.

THWING'S METHOD OF WIRING FRAMES.

right one first. Slip 2, Fig. 1, out and insert 3, repeating the process followed with 2, except that the staple slants the other way, so that in both cases it may strike the thicker strips of top-bar, see Fig. 3.

Before removing 3, seize a top-bar in the left hand (the pile of top-bars was laid so that all have the thick side of the bar at the left when lying grooved side up); press the end-bar 3, Fig. 3, in place with the small end pushed against the body; drive the nails home; slip the little spacing-block, 4, Fig. 1, in place, and drive the staple down to the proper level. Keeping the block in the left hand, and the hammer in the right, turn the frame and nail No. 2, Fig. 3, but do not drive the left-hand nail quite home, see Fig. 4. It projects $\frac{1}{8}$ inch to fasten the wire, etc. Turn the frame down with 3 to the right, and put 1 in Fig. 1 in place. The right-hand nail in 1 is also left projecting $\frac{1}{8}$ inch for reasons to be explained.

TO WIRE A FRAME.

Place on the support G, Fig. 6, with the end 2 at the right, the end 3 resting in the notch of J, Figs. 5 and 6. Start the wire through the upper middle hole at 7, Fig. 6, back through top at 6 to nail 5; loop it once around this; nail with $\frac{1}{2}$ inch or less over length, and drive the nail home with the hammer. With the shears cut off the wire at a mark near K, in Fig. 6, and finish the wiring through 8, 9, 10, 11, to nail 12; loop it temporarily about this nail, and tighten the wire. To do this rapidly and effectively, seize the middle of the top wire in the right hand near the right end, and catch the loop (now rather snug already) with the finger-nails of the left hand and slip the right hand along the wire toward the left to remove any kinks. Let go with the right hand first and seize the second wire to draw up the slack held in the left hand. Repeat the process, alternating the hands; loosen the end at 12, and fasten it tight. Last of all, loosen the button, remove the frame, drive nail 12 home, and, taking the loose end of wire in the thumb and finger, revolve

it three or four times about the point where it leaves the nail to break it off, and the job is done.

It takes a long time to tell it; but one minute is long enough in which to do it if you move fast and waste no time between motions.

This plan consumes two or three extra

inches of wire, but saves two nails and the time taken to drive them.

The plan of working both ways from the middle of the wire saves much time, and obviates practically all of the trouble from kinking.

[Nearly every one has his own peculiar way of doing things; but Mr. Thwing has devised a very simple and methodical plan for putting frames together, and his article will be very seasonable just now when apiarists are preparing to put together frames received from the supply-manufacturers.—Ed.]

MOVING BEES.

A Serious Accident, Resulting in the Loss of a Team of Mules; the Importance of Extreme Caution.

BY A. E. VB. FATJO.

Some three weeks ago I had an exceptional experience with moving bees; and for your guidance I give a hasty account of the occurrence. I was moving a few hundred colonies from one apiary to another, and on the day of the accident some 38 colonies were placed on a large hay-wagon drawn by four black mules. The wagon left the apiary at 4:30 A. M., and had traveled three miles over good, bad, and indifferent roads, when, after pulling up a rather steep and long hill, they reached a macadamized road. The teamster was told to rearrange and tighten his ropes. While moving the hives to a better place it seems the gable cover was strained enough to let a bee or two out at a time; but the next cover had closed the opening by being pressed under it, so when the hive was moved an inch or more the bees came flying out. I was driving a few hundred yards in the rear, and immediately hastened to the wagon, called for the smoker, that, unfortunately, the loader had borrowed from the apiarist (who was walking in the rear of the load), and, through inexplicable carelessness

ness, had let it go out. I tried to crush in some tissue paper; but the space between the gab'e covers was too small. I had ordered the teamster to unhitch the mules; but he lost his head, and, with the loader, managed to cover the ground as hastily as possible, not even stopping to look behind. In the meantime a bee stung one of the rear mules, and she swerved to one side and upset the wagon into a ditch on the side of the road. This broke open some ten or twelve hives, and the road was filled with thousands of bees whose temper was the keenest. They stung every thing in sight which had life. Even chickens did not escape. The poor mules looked as if thousands of gold buttons had been sewed on them; then as if streaked with white paint. As the bees left their lances in the mules I pulled out a veil from my pocket and drew it over my face, smashing with my hands the forty or fifty bees which were all over my head. I then took the Cuban apiarist's machete and proceeded to cut out the mules as fast as possible. After a half-hour's hard work I got three out, the fourth being jammed between the telephone-pole and the wheel. The mules were led about two miles away, and instructions were given to give each a pound of salt, and to take out the stings. But neither was done, and all three died an hour or so afterward. The fourth was not taken out for hours afterward, and then taken proper care of, but it also died. Why it lived longer than the rest was a mystery, as it was stung more frequently than any of the other three. My mare was stung about thirty or forty times, but was taken care of immediately, and two hours afterward I drove her back home. I will, later on, give you details, telling which of the covers, bottoms, etc., stood the least damage. I drank a large glass of extremely salt water, and, with the exception of feeling badly for an hour, I was not too sick to talk. I could not tell how often I was stung.

Santiago, Cuba.

[While this experience was disastrous to our correspondent, it may prove to be very valuable to our readers. We can not put too strong emphasis upon the necessity of having a good smoker well lighted, and ready for instant use. If Mr. Fatjo had had smoke at just the right time, the disaster could easily have been averted. But in an impending danger of this kind it is easy for one to lose his head. I remember once thinking, when a boy, what I would do if a friend of mine were drowning — of the methodical way I would proceed; how I would dive down after him, bring him to the surface and to the shore, and resuscitate him; but I shall never forget, when the *real experience did come*, how I seemed to be paralyzed. I saw my friend go down right before my eyes, within about ten feet of me. It seemed hours before I could recover myself sufficiently to use my reason. Then, instead of husbanding my strength, I struck out wildly under the water after

my friend, used up my breath, and struggled. If it had not been for timely assistance this tale would never have been told. Human nature is a good deal the same the world over; and when bees get on a rampage like this, one is not apt to do the wisest thing. Indeed, he might do the very things that these two assistants of Mr. Fatjo did do — and that was, to run. But our correspondent, if he had had a little smoke, would probably have averted the disaster; and if his helpers had done as he told them, the lives of the mules would in all probability have been saved. My own experience last summer convinced me that a pound of salt given soon enough to a horse badly stung will probably save its life. For the benefit of those who did not read of that experience I refer them to page 685, last year. — Ed.]

HONEY FOR THE GROCERY TRADE.

Importance of the Producer Keeping in Touch with the Retailer; the Grocer who Makes a Specialty of Selling Honey, and the One who does Not; Honey as a Food.

BY M. MOYER.

The honey trade this year has not been up to expectations. Prices opened in the fall rather high. The crop was reported short. Bee-keepers held back, and dealers were anxious to secure it. We still find considerable quantities in the hands of bee-keepers, and dealers have more on hand than they care for, and, in consequence, prices are easier. Many dealers would be glad to sell out at what they paid, and even at a loss. It appears that honey goes into use quite briskly at a certain price; but when held above that point other things will take its place. I think if bee-keepers would sometimes confer with some of the largest dealers at their conventions, and find out the best means to bring the value of honey as a food before the consumers it would be very much to their interests. At present it seems to be the aim of bee-keepers to get their honey off their hands at the highest prices, and care very little what becomes of it after that. They have not studied sufficiently the importance of creating a greater demand for their goods. A pail of good honey, sold in good condition, will create a demand for another one; but if it does not give satisfaction it spoils the sale of perhaps a dozen. I know from personal experience that families averaged 10 lbs. a month as long as they got a good article, and that one pail of inferior cut off that demand for a whole year. They imagined they got tired of honey, when the fact was the honey was not up to the mark. Honey requires a good deal of attention, and to be properly put before the customers; and this is not done when every grocer sells honey, and when any mixer can adulterate it and sell it.

Years ago there was very little honey

sold; in fact, there was not very much produced, and people in our city would buy it only in small quantities as a medicine. Handling only specialties at the time, we made honey one of them. We brought it before our people, and in every possible way impressed upon them the value of honey as a food. The result of this was, so far as our influence reached, that people used, I am safe in saying, five times as much honey as they do to-day. When it was noticed, by the ordinary grocer, that we were selling so much honey, they all dabbled into it, and, not wishing to do the advertising for others, we discontinued; and the result is evident all over the city. Common grocers, without any experience, were taken advantage of by some bee-keepers or mixers, and were loaded up with poor honey. This, as already shown, had the effect of checking the demand. People are, as a rule, very ignorant of the real value of honey as a food; and to educate them in this point, and how to put the best quality of honey unadulterated into their hands, is a problem of greater importance to be considered by bee-keepers than the skill of producing more. By wise and judicious work in this line I am sure that a market will open up for all the honey that will be produced in our country.

Toronto, Canada.

[M. Moyer & Son are general grocers and provision merchants of their city, and the statements made by the senior member of the firm can be taken with some degree of authority.—Ed.]

CAUSE OF WEAK COLONIES.

A Rational Cure for Spring Dwindling.

BY ARTHUR C. MILLER.

Among the many topics which bob up serenely every now and then is that of the treatment of weak colonies in the spring. It is one of those things which fail to get settled; but, after all, could much else have been expected when we consider how the subject has been treated?

I am going to try to settle it, for a while at least, by giving the *reasons* for some operations and against others.

Like many another trouble it is more easily prevented than cured, and more profitably; for, with but few exceptions, the weakness is due to faulty preparations the previous fall. Such faults, for instance, as poor or failing queens, or queens introduced too late in the season to small colonies or those composed mostly of old bees. Other causes are, too late preparation, late overhauling, and imperfect protection.

But having the weak colonies in the spring, what shall be done with them, and *why*? One of the old rules was, to unite enough such colonies to make a fair-sized one; but such never stay put. They steadily dwindle until they are as small as any part was at the beginning.

Another rule, but much less often given, is to unite one or more of the weak colonies with a fairly strong one. This practice is excellent. Here are the *whys*:

A colony weak in the spring is composed very largely or entirely of old bees. They must keep warm, gather food, and rear brood. Each day their numbers decrease rapidly, and but few young bees are hatched to take their place. The old bees are enfeebled; they easily succumb to the adverse weather conditions, and wear out quickly, the effort to keep warm and rear brood being too much for them to do successfully. Unite several such colonies, and you have not materially changed the conditions. It is just as hard for them to feed brood; nearly as much energy is required to keep the necessary heat, and their death-rate is the *sum* of that of the individual colonies. But put one or more such weaklings with a good colony. The old bees are at once relieved of all nurse duty, and of playing furnace. They start out from a warm hive, and can put every bit of their waning strength into gathering nectar, the usual work of such bees under normal conditions. While they last they are a real aid to the strong colony; and when they are gone, young bees, nourished by the nectar they have gathered, are ready to take their places.

Uniting in the fall is generally done under reversed conditions. The bees are almost always young, or a large part of them are; brood-rearing is decreasing, and field labor is about over, consequently a combination then of several small colonies into one good-sized one is successful if done early enough.

In talking about the age of bees in this connection it should be borne in mind that with them *age* consists of time elapsed *plus* work done. Find the *why*, and methods will create themselves.

Providence, R. I., Feb. 9.

[Your ideas are sound in theory and practice.—Ed.]

TENEMENT CHAFF-PACKING FOR WINTERING BEES.

Outdoor Packing in General.

BY G. C. GREINER.

We know from years of experience that we can not winter bees in single-walled hives on their summer stands with any degree of certainty. This applies to localities where winter conditions are the same as here in Western New York, with an occasional zero-blizzard of a week or more at a time. As a choice I should prefer a properly built bee-cellar to winter my bees; but as we can not all be as favorably situated as Mr. Doolittle, whose underground cellar does not vary more than $\frac{1}{2}$ degree from 45° F., no matter how the temperature changes outdoors, we have to do the next

best thing, and resort to chaff hives or their equivalent.

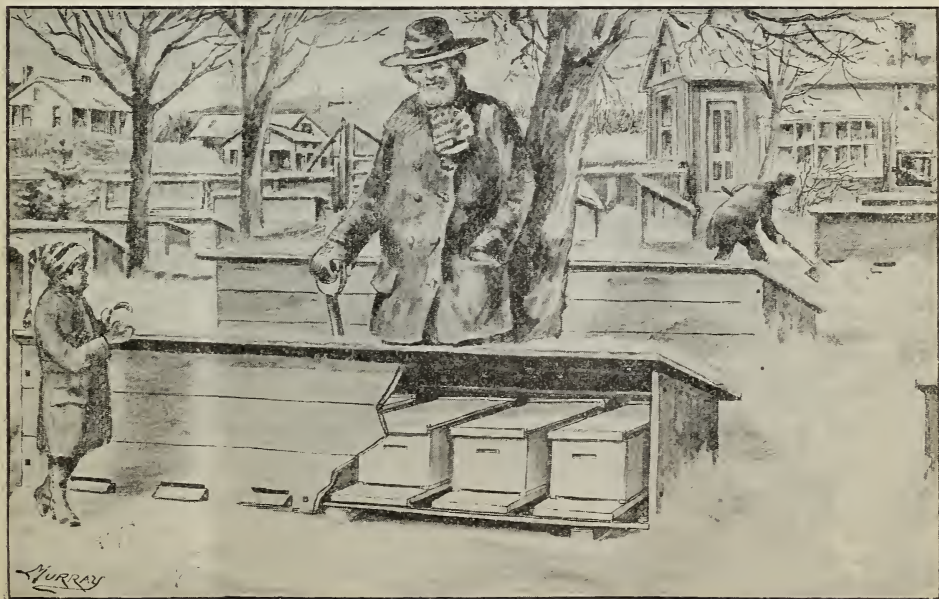
For winter use, chaff hives are all right; they give very good results in wintering, but they have some unpleasant features which make them very objectionable for summer use. To suit my individual notions they are too clumsy, too heavy to handle, and, what is still more annoying, they are not as accessible, supers as well as brood nests, as our single-walled hives. To overcome these objections I use now, after some experimenting, an adjustable chaff-box, which combines the advantages of a well-built chaff hive with the easy, convenient management of the single-walled hive.

The accompanying illustration gives the idea; a portion of the front and the chaff packing is left away. The box is made in sections; sides, ends, top, and bottom, are all separate. Each part is well cleated, and fitted to its place. The cleats are all on the inside. This may not be very essential, but it makes a nicer, smoother job in appearance, and prevents the water from soaking in, which it would do if cleats were on the outside. The whole structure is held together by eight square-headed three-inch wood screws, two at each corner, and four two-inch screws of the same kind, one in the middle of each side, and end at the bottom. The top is simply laid on; the only fastenings are the end cleats, which fit inside of the box to keep it from getting out of place. A layer of roofing-paper is tacked on to protect the whole from above. The dimensions of the box are governed by size and number of hives, and our individual preferences. I allow about three inch-

es of space all around for chaff packing, and put five colonies in one box. I have tried larger boxes, holding nine colonies; but I found, while they are more economical in regard to expense and labor, they are, besides other disadvantages, too large to be easily handled.

We all know that bees find their homes mainly by being accustomed to their location. Appearance, also, has a tendency to keep them from going astray. We can change either of these two factors (the former cautiously), and the other will be a help to pilot them home. In packing for winter we have to change both, and here is where we have to use some precaution to guard against loss of bees. As a rule, our bees are more or less scattered over the bee-yard during our summer campaign. I aim to have mine in rows of about eight or nine feet apart, and from two to three feet between the hives. In our chaff-boxes, with three inches of chaff between them, they have to stand nearly as closely as they can without interfering with one another. It would not do to move them from their scattered position and place them in a new habitation, so different in appearance, at the same time, but it is strictly necessary that they occupy the place they are to take in their chaff-box, long before the attempt to pack is made, to make sure that they are well acquainted with their location.

It may seem like a long job to move and arrange all the colonies of an apiary from their scattered positions into close-standing sets of five and five, but it is not. If rightly managed, if we use a little forethought during the summer in placing our colonies,



G. C. GREINER'S TENEMENT WINTERING-CASE.

keeping in view the arranging for winter packing, only about 4 per cent of all the colonies have to be handled at all. For instance, take two rows of ten each, eight or nine feet apart, with about two feet between in the rows. Move Nos. 1, 2, 6, and 7 of the back row ahead, and Nos. 4, 5, 9, and 10 of the front row back (the length of a hive at a time) until they all have reached their corresponding spaces between those colonies that were not moved. In this way only eight of the twenty have to be handled; and if we have a few extra stands to start in with, so that each colony need not be picked up twice, a very few minutes each day will accomplish the whole operation in less than a week.

The packing should be done before winter sets in. I select some cool pleasant day in November when bees are not flying. When every thing is ready, boxes, chaff, etc., on the spot, the colonies that are to go in one box are set on the ground in front of their stands. These latter are then taken away, and the bottom of the chaff-box put in their places, using two blocks the same height as the stands for foundation. As a protection from below I spread two or three thicknesses of carpet or burlap on the bottom, not only to protect against cold, but to guard against all possible jarring also, for my aim is to make the change without arousing the bees. The colonies are then set back on this so prepared bottom; and if every thing is done just right they occupy exactly the same place they did on their stands. After this the building-up of the box, and filling in the chaff, is an easy matter. If I wish to pack with upward absorbents and ventilation I fill in chaff level with the hives; remove the honey-board, and cover with quilts or blankets, and finish by filling the box with additional six or eight inches of chaff. Laying on the roof completes the job.

The unpacking is done in very much the same way, but in reversed order. The top is removed, and all the chaff above the hives gathered up. I put mine in large sacks, store in a dry place, and use again the next fall. The sides and ends are then unscrewed and laid flat on the ground to catch the chaff that was used around the outside, and as much from between the hives, as possible. After all the chaff and the different box sections are taken care of, the colonies are again set on the ground, the last remnants of the box removed, and the old spot is once more ready to receive the stands and bees.

La Salle, N. Y.

[But, friend Greiner, why do you think it necessary to have your bees scattered so far apart during the summer? It economizes room and steps to have the hives in groups. The groups may comprise as many as eight or ten hives; but usually a less number is

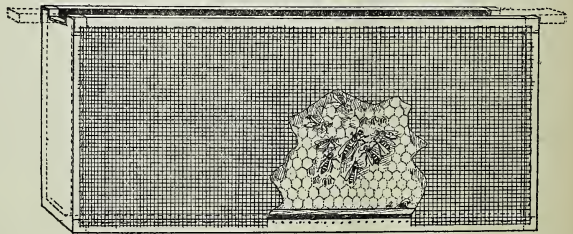
better. It is our practice to put our hives in groups of four or five; hives in a group five or six inches apart, and the groups about ten feet apart. If you practice the grouping plan throughout the entire summer you will see its advantages, and save the trouble and annoyance of shifting your bees every fall and spring, to say nothing of the loss you would save in bees.—ED.]

A BROOD-FRAME INTRODUCING-CAGE.

What to Do when a Colony Refuses to Accept a Queen.

BY. C. V. KINTNER.

By reading GLEANINGS since 1879 I have found a good many things in its pages that are valuable. I should like to describe an introducing-cage that might be a benefit to some one. I will give some idea of my luck in introducing queens. When Mr. Hutchinson advertised his Superior stock for sale I sent him an order for a queen, and I lost her in introducing. I wrote him my luck, and he sent me another. She proved to be a hybrid. I wrote him, and he sent me a third queen. I then sent him money again for a queen, and I lost that one. I wrote him, and he sent another the second time, and I lost her. I concluded not to say any thing more; but Mr. Hutchinson wrote me a letter afterward, and in answering him I told my luck again. He answered me, and said he wanted me to have something for my money, and he sent me a third queen. I lost that one. I then tried to cover the cost of the last one, and sent him 75 cts. I then saw I would have to devise some method of introducing queens or I could never improve my bees. I made a wire cage large enough to take in an L. frame of brood, of which the following are the general specifications:



KINTNER'S BROOD-FRAME INTRODUCING-CAGE.

The bottom and ends are made of tin bent in a trough or square-box shape at each edge, the proportion being a tin 4 inches wide with one inch turned up. An L-shaped tin forms the sides of the top-bar, but at each end of the double tin bent over, so as to increase strength. All corners are well soldered. Along the inner edges of all these tins are small holes $\frac{1}{4}$ inch apart, used in sewing with foundation wire the wire cloth which forms the sides of the box. When a frame is placed in position,

and hangs in the cage with the new queen and her retinue, and other bees if desirable, there is a bee-space left on all sides of the frame, the top-bar of the frame filling the whole cavity of the box at the top, thus excluding the rest of the colony. This box with the frame inside takes the space of two ordinary frames; otherwise it hangs in the hive like the other frames.

To introduce, first remove the old queen and then take a frame of very nearly all capped brood, and, if possible, a frame with many young bees just cutting their way out. Remove all bees from the frame; put your new queen with her escort on the frame or in the box, and hang the same in the cage in the hive. As this cage or frame takes up more room you can make room for it by removing some frame that has little or no brood in it.

The last queen was introduced in the manner just described, and, indeed, was forgotten for a week; and when I went to remove her from the cage the frame was found to be full of young bees, and every cell had an egg where young brood had been hatched, and some good-sized larvæ in the comb. All queens were introduced successfully, and I believe it to be as nearly infallible as any method we shall ever find.

Carrollton, O., Dec. 23.

[There may have been a reason for your continued failure to introduce by the method given by Mr. Hutchinson. I should assume, under the circumstances, that there was either a fertile worker or a good-for-nothing virgin, either of which was so insignificant and small, and so much like the common bees, that you failed to observe her presence; but after you adopted the large cage for inclosing the brood-frame, you had, of course, no difficulty in introducing the last queen to the hatching bees. The presence of a good laying queen, protected by the wire cloth, and practically in the center of the hive, with eggs and brood in all stages, doubtless induced the bees to destroy their worthless queen-mother, if they had one, and made them think, therefore, they had better take up with something of some use.

I never let a colony kill more than two queens for me. If they kill the second they are pretty sure to kill the third one and the fourth. Once in my early experience I had a colony so notional that they killed about five queens. They would even tear down the cells we gave them. Finally I stole a march on them—let them build their own cells, and then grafted them with larvæ from an imported queen. In the course of time I had a first-class laying mother doing full service. I know this colony was queenless, because they would continually start cells. But nine times out of ten when a colony persists in killing every queen that is introduced it has something in the hive that it recognizes as a queen; and until that something is removed it is a waste of time and money to try to introduce.

Your cage may be an excellent arrangement for introducing a very valuable queen in any colony, whether obstreperous or not; but if I wished to be perfectly sure, I would put a frame of hatching brood in a nucleus by itself, for there is a possible danger that, when the wire cloth is taken away, the older bees, which have not had actual contact with the new mother, might destroy her.

There are not many queen-breeders who would have been generous enough to continue sending queens, as did Mr. Hutchinson. He is one of those few, and I am glad to hold him up as a worthy example to some other queen-breeders who refuse to give their customers the benefit of the doubt. I believe it always pays to be liberal—that is, go more than half way in dealing with patrons. But there are some who will not be satisfied with any reasonable form of adjustment. There is no use, in such cases, in casting pearls before swine.—ED.]

MURMURS FROM TEXAS.

Pseudo-science versus True Science.

BY WILMON NEWELL.

There are a few points which among bee-keepers at present seem to be popular bones of contention. I am, therefore, tempted to take a crack at them myself.

The first of these is that "umbilical cord." The subject as at present being discussed by the bee journals is fast becoming ridiculous. While I do not like to differ with such an eminent authority as Dr. Gallup, still he has made a mistake, no doubt, about it. If he will examine any standard work upon anatomy, physiology, zoology, or embryology, he will find that the umbilical cord is one of the membranes having for its purpose the nourishment of the unborn foetus (or embryo) of *mammals*, and of *mammals only*. The umbilical cord and the placenta in their origin are closely related, and arise as *developments of the mucous membrane lining the uterus of the mother*, and are in no way developed as structures of the embryo. The umbilical cord serves to carry on the circulation between the tissues of the embryo itself and the placenta or embryonic sac surrounding it. How, then, can a queen-bee, which is *not* developed within the body of the mother, possess such an organ? The name "umbilical cord" is applied to a structure which occurs in *mammals only*, and no amount of argument can change the *meaning* of the term.

What I strongly suspect is this: Dr. Gallup has discovered, in the development of queens under the most favorable conditions, an organ or tube through which the queen is enabled to take up some of the surrounding food-media, after passing into the pupal stage. However, with all due credit to the doctor for his discovery, the fact still remains that he has given this structure, or organ, an entirely erroneous name. It re-

mains to investigate the formation and growth of this organ, to determine from what segments or portions of the body it is produced, and name it accordingly. When a queen with an "umbilical cord" appears in our apiary, we will immediately investigate her anatomy with a view to ascertaining just what that structure is.

Another bone of contention is that of *Bacillus alvei* and *Bacillus mesentericus*. Dr. Lambotte's contention that these two germs are identical is not well supported, as shown by his own statements. While the fact that these two germs have the same general form and appearance under the microscope, while both have the same effect when injected into the circulation of an animal (presumably a guinea-pig or a rabbit), and while cultures of *mesentericus* may destroy more or less brood, these arguments are not convincing. Any foul decaying matter—which is really what a culture of *mesentericus* amounts to—spread over healthy brood, would be likely to kill it. Cleanliness is as much a necessity for the development of bee-larvæ as for the development of a small babe. Likewise Dr. Lambotte found that *Bacillus mesentericus* would grow on cultures made of the larvæ of bees. *Mesentericus* is a saprophytic germ; that is, one which derives the organic material for its growth from decaying organic matter (in contradistinction to "parasites," which derive their nourishment, or part of it, from living organisms). True saprophytes are rarely confined to any one material as a "host," but the same saprophytic germ may often be found upon a variety of materials. Dr. Lambotte's assertion that cultures of *mesentericus* killed larvæ, but failed to start a contagious disease, is strong evidence that *mesentericus* is a true saprophyte, and not in any sense a parasite, as is *Bacillus alvei*. Past experience has demonstrated that the introduction of *Bacillus alvei* into an apiary when brood is in the hives invariably results in contagious foul brood. No other kind of foul brood is known. This, *mesentericus* has failed to do; and until Dr. Lambotte has demonstrated that the introduction of *mesentericus* produces a contagious disease in no way distinguishable from foul brood, his statement that the two species are identical must stand as extremely doubtful.

College Station, Texas, Jan. 27, 1903.

[I am glad we have so capable a man as Mr. Newell at the Apicultural Station in Texas to separate fact from fiction and false science from real science. When I first saw the reference to the umbilical cord, I regarded it more as a joke than any thing else; but apparently a good many correspondents began to think there was some "science" about it. That there may be something corresponding to the so-called umbilical cord is probably true.

Mr. Newell's statement regarding *Bacillus alvei* and *Bacillus mesentericus* is undoubtedly true science. It did not seem

possible at any time that an old and recognized form of rot was an old enemy under a new name.—ED.]



SELLING HONEY THROUGH THE U. S. EXPRESS CO.; A GOOD SUGGESTION.

I wish to inform my fellow bee-keepers that I have found a safe and easy way of selling honey. The U. S. Express Company publishes a list each month of goods for sale along its line. You write to the Order and Commission Department, New York, stating what you have to sell, and from what station. They will print it and send the slips broadcast. I have sold every bit of my honey at a good figure to agents in Indiana, Pennsylvania, and West Virginia. If you have honey to sell, call on your nearest agent for information.

Spottswood, Va. W. E. TRIBBELT.

[Your suggestion is a very good one; and while we have known that the United States Express Co. did a general commission business of this kind, the matter has never yet come before our readers. It costs nothing for a bee-man to apply to his local express agent; for, indeed, the express company charges nothing, for, as the company says, its remuneration comes out of the haul of the produce. Mr. Tribbelt incloses one of the U. S. Express Co.'s commission blanks. The following is an exact copy of the heading and announcement:

UNITED STATES EXPRESS CO.
ORDER AND COMMISSION DEPARTMENT.
PRICE LIST No. 99 NEW YORK, JAN. 22, 1903.
Agents must have these lists distributed among our patrons

Dealers can buy, and producers can sell any and all commodities they handle through our O. and C. Department. Our agents will solicit orders from dealers and quotations from producers, and furnish information relative to this department. All prices F. O. B. at shipping-point, and subject to market changes. All orders must be given to the local agent, who will furnish proper stationery, and forward same to the agent at shipping-point. No guarantee given; our agents simply transact business between producer and dealer for the express charges derived therefrom.

Immediately following this is a long list of various kinds of produce, telling where the same is located, and the price. At various points in Michigan, fish is quoted at 10, 7, 6½, 4½, according to the kind. Celery is another prominent item. Apples, grape juice, lettuce, nuts, honey, maple sugar, eggs, poultry, butter, pet stock, swine, etc., are listed.

These commission blanks are sent all over the United States, and any one can often obtain produce at reasonable figures. Among the items of honey I notice two tons

of white clover at 13½ in 1-lb. sections, at Eau Claire, Wis. Another item of white clover at 18 cts.; amber at 16, in the comb or bottle, at Noble, Pa.; still another is white clover at 12½ cts. at Spottswood, Va., the postoffice of our correspondent above, and which he says he sold at a satisfactory figure. Observe, you pay no commission except the express; and if you sell to the other party, "he pays the freight."

The advantage of this commission scheme is that one can pick out the nearest post-office having the kind of produce he desires to secure. He simply goes to his local express agent and asks him to get what he calls for.

And, again, when he has produce to sell he gives the items of it to his local agent, and requests him to place it in the commission department of the company at New York—no writing at all until a customer is found, when the sale is consummated and the cash turned over. If you do not wish to trust your man, all you have to do is to send the produce subject to the C. O. D. plan, by which the express company will collect your money and turn it over to you without any chance of loss on your part.

The practicability of the scheme lies almost entirely in the fact that very often a customer a short distance away can be secured, when the express charges will comparatively light. For long hauls or heavy shipments the plan would not be feasible.

If your honey is sold to other parties through other channels, you will, of course, notify the company that the goods are disposed of; but, ordinarily, if one places his produce in the hands of the express company he should wait a reasonable time for returns.—Ed.]

HOFFMAN FRAMES TOO MUCH STUCK UP WITH PROPOLIS; HOW TO CONVERT INTO MILLER NAIL-SPACED FRAMES.

Dear Dr. Miller:—I have almost decided to take my jack-knife this spring and cut all the end-bar projections off my Hoffman frames, thus reducing them to the regular hanging frame. I have about 800, many of which have been in use from five to ten years. As the result of your experience and excellent practical judgment I want you to advise me in the matter. My objections to Hoffman frames are, too much propolis; crowds the division-board against the side of the hive; the frames can not be crowded close enough in the spring; can not be used to advantage in supers for extracting; must be spaced like hanging frames—that is, only 7 in an eight-frame hive, and 8 in ten-frame, thus doing away with the Hoffman principle, and making them non-interchangeable. There are other objections, such as increase of cost, and necessity for extreme accuracy in making. Last spring I had 300 made by a regular dealer in supplies, and he made awful work. The advantage of rapidity in handling, shipping bees, and moving to out-apiaries, does not count with me. To put

it very mildly, I would say that for the extracted-honey producer they are a decided nuisance.

ALPINE MCGREGOR.

Inglewood, Ont., Can., Jan. 17.

[Dr. Miller replies:]

Where there is no propolis there is much advantage in the partially closed ends of the Hoffman and the automatic spacing. The trouble is that you have propolis, and the frames which worked like a charm when in use only a week become intolerable with time. Your jack-knife remedy would, I think, be an improvement; and if you don't care for rapidity of handling nor exactness of spacing, then nothing further is needed. Pardon me, however, for doubting that you mean just what you say when you say that the advantage of rapidity of handling does not count with you. Automatic spacing I think we must have in some form, for rapidity and exactness.

Answering you categorically, the probability is that reducing your frames to loose hanging frames will be better than to keep them as they are. I have done more or less whittling on mine; and if I were to come to a hive full of Hoffmans now, it would be a question whether I would transfer them into Miller frames or whittle the objectionable projections and then make them self-spacing with nails or staples.

If you take the latter course, whittle away the V-shaped edge (leaving the other edge untouched) until you make the end-bars 1½ inches wide. Then take a wire nail or a staple, and drive into the unwhittled side at each end until it projects ¼ inch. These will work very well mixed in with Miller frames, and I advise any one in a gluy region to try a few of the latter.

Marengo, Ill.

C. C. MILLER.

[We have made an effort to introduce frames with metal spacers, and for several years have offered for sale staple-spaced frames. Yes, we have, where we thought propolis was bad, recommended them in preference to the Hoffman; but "they don't go." I have been surprised over and over again to learn how the trade will have the Hoffman. After all, it is only in certain localities that propolis seriously handicaps the handling of such frames. Propolis, though, is very bad in Marengo, much worse than it is here in Medina, and I do not blame the doctor, nor, perhaps, our correspondent, for wanting something else.—Ed.]

THE DANZENBAKER AND THE EIGHT-FRAME LANGSTROTH HIVE.

I have 55 colonies of bees in 8 and 10 frame chaff hives. I expect to increase 25 next year; and what bothers me is the hive-body, as I make my own outside or winter case.

Would you advise me to buy the Danz. or the Langstroth Dovetailed? Will bees store more honey in the Danz. than the other? Will they winter as well (that is, will they need as little feeding?

I run for comb honey, and want the very best hive I can buy. Which is the better—the 8 or the 10 frame Langstroth?

Winchester, Ind., Nov. 24. C. A. Yost.

[For the production of comb honey, especially a fancy article, I know of nothing better than the Danzenbaker. While, as a rule, one hive will not produce any more honey than any other standard hive, yet the one *may* put *more of it in marketable shape*. Our own experience is that the Danzenbaker will have less honey in the brood-nest after the honey-flow, and more in the sections. The brood-nest being shallow, the honey is forced above. Take, for example, the Danzenbaker and eight-frame Langstroth-Dovetailed hive, each would produce, we will say, 75 lbs. of honey, both comb and extracted. The Danzenbaker might have the proportion of 65 lbs in the supers and 10 in the brood-nest, while the eight-frame Dovetailed, being deeper, might have 50 lbs. of comb honey in the supers and 25 lbs. in the brood-nest. In this supposable case the Danzenbaker would have 15 lbs. more of comb honey, which, we will say, is worth 15 cts. per lb., as against, perhaps, 15 lbs. of extracted honey at 7 or 8 cts. per lb. in the eight-frame Dovetailed.]

This is, possibly, putting the proportion a little stronger than it would be in practice; but Mr. Vernon Burt, who is rapidly changing his eight-frame Dovetailed hives over to Danzenbaker, says, after three or four years' test, he is fully satisfied that he can clear more money with the Danzenbaker than he can off the eight-frame Dovetailed. In other words, he converts honey in the brood-nest into comb honey at a higher price. If he sells this at 15 cts., he puts in its stead, after the honey season, a three or four cent syrup made from the best granulated sugar. He therefore cleans up ten or eleven cents if the proportions I have named hold true. Suppose he cleaned up only five cents, then for every pound of honey he gets more from the Danzenbaker than he would over the Dovetailed, he makes five cents. If in the supposable case he gets 5 cents more, his profit in the Danzenbaker over the Dovetailed will be 75 cts. On 100 colonies this would amount to \$75. Now, please do not, any of you, go and take this supposable case and make out that I claim that the Danzenbaker will clean up 75 cts. per hive more than the Dovetailed. I simply wish to illustrate that a shallow hive may, under favorable conditions, make more money for its owner than a deeper hive that will accommodate just so much more honey in the brood-nest.—ED.]

APIARY IN STRAIGHT ROWS OR ON THE HIT-AND-MISS PLAN.

Up to this time I have had my hives (50 colonies) scattered around promiscuously, giving me some trouble in attending to them this way. A few days ago I put them in two straight rows, about a yard apart. Some one to-day suggested that this would

give me trouble, the hives all looking so nearly alike the young queens would get mixed up and I would be likely to lose some of them. Will you kindly give me your idea?

W. P. SMITH.

Penn, Miss., Feb. 9, 1903.

[It is true, there is some objection to having hives in straight rows, all hives alike, and all opening in the same direction. At our yard in Medina we found it necessary, years ago, to have the entrances point to the four points of the compass, and to arrange them so there would be no two hives pointing in the same direction within thirty or forty feet.]

If you happen to have a variety of hives, mix them up in the row; then, where possible, station one hive near a shrub for shade; another near a tree, and another near some other distinguishing object.

The plan we now like best is grouping, putting three or four hives in a cluster, perhaps ten inches apart, and each group ten feet from any other group. One group can be placed under a big tree, and another group under a small one. Still another can be placed near the bee-house, and another before some other equally prominent object. A bee, on returning from the field, seeks its group and then singles out its own hive-entrance in the group, which, if there are three hives, may be the one in the middle or the one on either side. The bees in one group do not get mixed up; but it sometimes happens that young bees will fly from one hive in a group, say from the northeast corner of it, and return to the northeast corner hive of the group next adjoining. But all this will be avoided if one group looks different from some other on account of some surrounding object. Where trees are scarce there can be several groups in between the trees. Those groups unshaded should be covered with shade-boards. This alone will make a distinguishing characteristic, and will help to avoid the general confusion.

Unless one is rearing queens he does not need to pay so much attention to the arrangement of his entrances. It is only the young bees that get confused, as a rule, and they are generally accepted in any hive.—ED.]

AN OPEN LETTER FROM THE RAMBLER'S PASTOR; THAT CLOUD OF SORROW; SOMETHING OF THE RAMBLER'S CHURCH LIFE.

A friend has sent me a copy of your journal containing the obituary notice of John H. Martin, formerly of Hartford, N. Y., and I can not forbear writing a few words, as his friend and former pastor, expressing my appreciation of your estimate of this noble man, who has gone to his reward, and adding my own tribute to his Christian character and sterling worth.

My ministry began with the First Congregational Church of South Hartford, N. Y., April, 1889, of which church John H.

Martin was the senior deacon. All of my correspondence was with him regarding the pastorate, and he thus stands in a peculiar relation in this way with the beginning of my ministry. During the years of my pastorate we were brought very closely together. I came to know him thoroughly. Scores of times we were in consultation regarding affairs pertaining to the church, and a warm personal friendship accompanied all. In your article regarding his life you call attention to the large fund of humor that the "Rambler" had. This is true, and yet he was a man of heavy burdens and of great sadness of heart as well. I remember very well meeting him one morning when, as I noticed how careworn and pale he looked, I asked concerning his trouble. He replied, "You know it is written, 'Hope deferred maketh the heart sick'" (Prov. 13:12). There is a case of real heroism here that this brother, instead of surrendering to his sorrows and trials, looked on the bright side, and allowed humor and good cheer to win; and in this I am sure his Christian faith was his great aid.

A noble Christian gentleman of kind spirit, and an earnest desire to benefit his fellow-men, has gone home to God. His body rests near the noble hills he so dearly loved, and his memory will long remain in the hearts of those who knew him, and in the knowing learned to love him; and the Rambler's last journey over the goal, we believe, has been to the heavenly city.

C. W. WILSON,

Ashland, O.

Pastor Cong. Church.

[We are very glad to hear from Rambler's old pastor. We knew the Rambler as a bee-keeper, as an inventor, as a traveler, as a humorist; and we knew, also, he was a man of sterling Christian character; but Mr. Wilson has opened up some phases in Rambler's church life that may be of interest to his friends, and we gladly present them to our readers.—ED.]

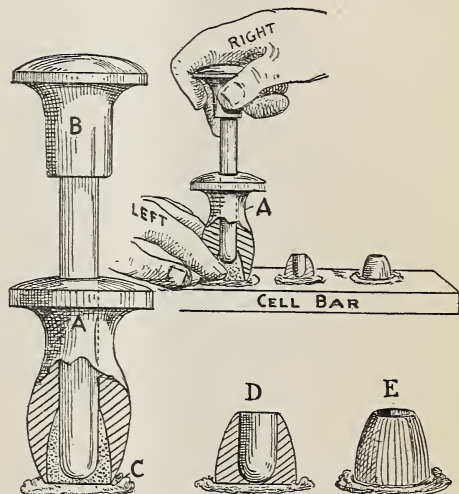
CARTER'S CELL-FORMING AND CELL-STICK-ING STICK.

There is an item on page 587, last year, in GLEANINGS, where it speaks of buying cell-cups. It would be too slow work for me to stick them fast. I should prefer the wax in a little ball; and, with an invention of mine, press it fast to the bar. Thus the making and fastening are done in a second or two. My device is made of wood, as shown. It is best to make of boxwood, as that kind of wood will make the smoothest cell-cup, and sharpest on the edge. I have one of that kind, and it works very well.

DIRECTIONS.

Wet or soak the machine in water, and keep it wet so the wax will not stick to it. I use medium brood foundation cut in pieces an inch square, and in a warm place, so the wax will work easily. I gather a piece up in a ball and put it in the end where

the largest hole is at C; then I press the wax down on the bar where I want it to stick, and hold it there with my left hand. Then I push the former, B, down the small end of the hole A, and turn it part way round, back and forth, two or three times, and still keep pushing down with my left hand until the former has been well pushed down. I turn back and forth to the right and left. I next hold the former down, and lift up and turn to the right and left with my left hand. That takes the one piece away from the wax while the former holds



it fast to the bar—see upper part of the drawing. Gently turn the former to the right and left, and lift the former out of the cell-cup, when the result is as shown at D and E.

C. K. CARTER.

Eagle Grove, Iowa.

[We sent this device to our artist, Mr. Murray, of Cleveland, requesting him to follow directions so that he could show the *modus operandi*. After finishing the drawing, he tells of his experience as follows:

I have tried the device, and have no doubt it will work after a fashion; but in my hands, working under difficulties, the product was rather ragged and unsightly, and I think it would have a tendency to make bees cross-eyed; but practice would no doubt greatly perfect it. As you sent no wax I purloined wife's ironing-wax, and in due course of time had cells galore from Dan to Beersheba all over the kitchen-sink, greatly to said wife's astonishment, and imminent danger to the *statu quo* of the family. After all, I would pronounce the thing a success in skillful hands.

R. V. M.

I did not try this device myself, but gave it to an employee to test. His experience with the first lot was much the same as Mr. Murray's. I believe the principle to be correct and right. We prefer, however, to form the cells on the same general plan by the thousand, and then stick them on the bars afterward, for we believe we can perform the two operations separately in less time than in one operation as shown above. We will show our plan a little later.—ED.]

THE POSTOFFICE OF MR. J. M. JENKINS
CHANGED TO HONEYSUCKLE.

Please change my address from Wetumpka to Honeysuckle, Ala. I have not moved—still doing business at the old stand; but a new postoffice has been established right on our premises, and we are now able to get GLEANINGS, our letters, orders, etc., about two hours earlier, and have one hour longer to work before the mails are closed to go out. We hunger and thirst for our mail, for we want to work it up and answer promptly, and this change will help us greatly in our efforts to be prompt. As it was, the train passed within 30 feet of us, going to Wetumpka station, thence nearly a mile in a push-cart to the postoffice, and when all the mail for the town was distributed, registers written up, etc., by using a bicycle the boy could get ours to us *by and by*. About two hours later we had to send over what we had ready, and the rest of it next time. I made application for a postoffice, stating the facts as they exist, and asking for investigation of same. The Department was fair enough to see the disadvantages a growing business was laboring under (to say nothing of any near neighbors), and gave us the postoffice, with two mails per day. So when you come to see us again, get your ticket to Wetumpka; but when you write us, remember we shall receive it hot from the track at Honeysuckle, Ala.

J. M. JENKINS.

Wetumpka, Ala., Feb. 21.

[When I visited Mr. Jenkins, nearly two years ago, it seemed to me a little strange that all his mail matter, which might have been unloaded within a short distance of his factory, had to go two miles across the river, then back again, making hours of delay. Mr. Jenkins is to be congratulated on the change. If I remember correctly, the honeysuckle is a prominent plant in his neighborhood.—Ed.]

GOLDEN AND LEATHER COLORED BEES COMPARED.

In GLEANINGS for Feb. 1, page 1, I noticed that the *leather-colored* bees are spoken of as "probably the better bees;" and my experience of a good many years is that the leather-colored bees for honey-gatherers are the best, but they do not build as white comb as the goldens. Three seasons ago I had in my bee-yard, in Georgia, a golden queen selected out of 24 from J. B. Case, and also the leather-colored "red clover" queen from your apiary, and in the spring they started off with the same conditions; but the red-clover colony produced several pounds more than the golden, but capped dark and greasy-looking, while the golden colony produced the most beautiful section honey I ever saw. Neither colony showed any disposition to swarm. These were the two finest queens I ever owned. I have purchased a good many queens from different breeders, directly and indirectly, and

out of each lot some of them always proved inferior, except the lots from J. P. Moore, which always made a good average, though none of them ever came up to your red-clover queen or the one extra one from J. B. Case. All points considered, I think this Case queen the finest I ever owned; but she was an exception to most goldens.

Wewahitchka, Fla.

D. R. KEYES.

[We are glad to get this good word for the Italian queens, even if it is a good advertisement for some of our friends.—Ed.]

ROBBING OUT THE BEE-TREE.

On page 155 you say that J. A. Macdonald secured no honey from the tree. Why couldn't he set his bees to robbing the stores in the tree, after all the brood emerged? In a cherry-tree near my yard is a colony I have planned to kill next fall, and then introduce a pint of my bees to bring the honey to my hive. Would not that plan work well and safely?

I like GLEANINGS first rate, and am so new at the business that nearly all is instructive to me, but perhaps the questions and answers are most so.

Reading, Mass.

N. A. SPARHAWK.

[Yes, certainly, the bee-tree could be robbed out providing there were no young bees just hatched to defend at the entrance.—Ed.]

ALSIKE; DOES IT YIELD EVERY YEAR?

Will alsike produce honey every year? If so, would not that when raised for seed with white clover, red clover, catnip, and a sprinkling of other honey-plants in the fall of the year, make a locality among the best as a honey-producing one?

Can bees be sent by fast freight in spring, with safety? O. H. Townsend says they can. What do you think about it?

Leland, Ill.

F. W. MORGAN.

[You can set it down as a rule that no honey-plant will yield honey every year, and the clovers are no exception unless perhaps it be the alfalfa in the irrigated regions, where conditions are largely under the control of man. Alsike affords one of the best artificial pasturages there is known. But you might sow acres of it, and still not be able to make any perceptible increase of honey in your hives; but when farmers all around you sow red clover or alsike largely, then you will be able to get some surplus. But there ought to be at least 50 or 100 acres of it within range of the bees.

If a number of colonies are to be sent at one time, by all means send by freight, fast or slow, but send a man along with them. It is not practicable to send bees by express, except in nucleus or one-colony lots. Bees go at a rate and a half, and they do not have to go very far by express before the express charges more than equal their

value. There is no trouble about sending bees by freight, and that is the *only* way to ship them in any quantity.—ED.]

HOW BUTTERFLIES INDIRECTLY DO DAMAGE TO ALFALFA.

On pages 11 and 148 mention is made of butterflies damaging the alfalfa-blossoms. While the butterflies themselves probably do a great deal of damage by sucking the nectar from the blossoms, thus depriving the bees of large quantities of honey, the worst damage is done by the worms which hatch from the eggs laid by the butterflies. They are something like the web-worm, and are very destructive here some seasons, not only eating practically all the blossoms, and so destroying all chances of a seed crop, but they also do much damage to the hay crop by eating a large proportion of the leaves.

E. S. WEBSTER.

Hutchinson, Kan., Feb. 27.

[I was sure I was not misinformed when I stated that the butterflies did damage to the alfalfa. Our correspondent explains just in what way they work havoc among the alfalfa-blossoms.—ED.]

DYSENTERY NOT CAUSED BY CONFINEMENT; FORCED SWARMS; WHAT TO DO WITH THEM.

I notice on page 106 a case of bee dysentery which was not caused by confinement, by Mr. Henry B. Jones. Our bees were affected in the same way last spring.

Would the shake-swarm method be a good thing in this locality for increase? Do you put the "shook" swarm on the old stand, or move it away and leave the mother hive there? Would it be better to let the young bees raise their own queen or give them one?

J. G. KYLE.

Velasco, Tex.

[The forced swarm is put on the old stand, while the old colony may be put a few inches to one side or on an entirely new location. It would not be practicable to put the forced swarm in a new location, as too many of the bees would return to the parent hive. As a rule, the new swarm has the queen, and the parent colony raises a queen from the cell given. But the procedure may be varied by introducing a laying queen, but no great advantage would be secured.—ED.]

FORCED SWARMING; BEES IN PARKS, ETC.

1. In forced swarms will the parent hive as well as the forced swarm give surpluses the same season?

2. Which of the two will most likely do the better work?

3. Which should have the old queen for best results?

4. Will an inch-mesh wire-netting fence six feet from the hive-entrances, standing four feet high, interfere greatly with the convenience of the bees?

5. Would bees do well in Gordon and Wade Parks, Cleveland, where there is much shrubbery and many perennial plants?

6. Is the country east of the State Hospital for the insane, in Newburg, a good honey district?

7. If I wire my frames horizontally, and put in 3 or 4 perpendicular inch strips, imbedding them in the wires, will the bees build the rest of the comb with the midrib to the wires? and will they build all worker comb if the strips are worker foundation?

CHAS. R. NEILLIE.

Miles, O., Feb. 2.

[1. No. Surplus would be expected ordinarily, from the forced swarm only.

2. The forced swarm, if put on the location of the old hive, would gather altogether the most honey. As a rule very little honey would be secured from the parent hive, and none at all if manipulated according to the directions ordinarily given, by which all the remaining bees at a second drive are given to the swarm.

3. The swarm should have the queen.

4. No.

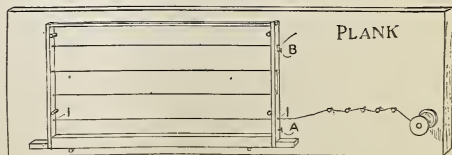
5. I see no reason why this should not be an ideal location.

6. This ought to be as good a location as any other portion of Ohio. Not knowing the locality I could not give you any definite information.

7. You can work this plan, providing it is not the season of the year when the bees are building store or drone combs. The bees would unite the several strips into one comb. But such a plan is very objectionable, from the fact that the bees would have to join on several strips of comb; and even if they were disposed to build all worker, the line of demarcation would result in irregular cells, many of them drone size. Better by far use horizontal starters, fastening to the top-bar.—ED.]

A SIMPLE METHOD FOR WIRING FRAMES.

Having bought a lot of frames, and wire to wire them, I was lost to know just how to do it. I will give you the way I did it, which works very nicely, and the wiring-board costs nothing.



Drive ten 8-penny nails into a plank from the bottom as shown; one to hold the spool, five for the tension, and four to hold the frame. Drive two small tacks in the flat edge of the end-bar at *A* and *B*. Put the wire through the holes *I, I*, and draw through till as shown in the cut; then thread and tie the wire to tack *B*, and

drive it up. Now tighten and secure to tack A, drive up, and twist off the wire.

A. P. YOUNG.

Cave City, Ky., Feb. 7.

[Your plan is very simple and good. The scheme of having nails driven in a zigzag line next to the spool is excellent, because it will make just enough friction to enable drawing the wires reasonably taut.—Ed.]

FORCED SWARMS.

After having read so much about forced swarms I am prompted to suggest that there will be many novices who will make many serious mistakes in this line. In the first place, very few will know when the colony is ready to be forced, and then it is not any simple matter to get the bees in just the right condition. In my opinion a colony that is in moderately good strength should not be bothered unless there is unmistakable evidence that it is preparing to swarm. I think this forcing business is for people who have out-yards which they can not attend to; but for the average bee-keeper I think the matter of swarming should be left to the bees. I shall have about 30 colonies this spring, and shall be satisfied to clip the queens and allow the bees to do the swarming.

I think we shall have the earliest season I have ever seen. I was out in the yard yesterday, and noticed the bees bringing in pollen to a considerable extent. Will you please tell me if this is an indication that there is brood in the hive, or do they bring in pollen before the queen goes to laying? If we do not have any unusually cold weather during this month my bees should be ready to swarm by April 1, as they will have nearly two months to breed up, and they have the greatest abundance of good stores, and a few trees are beginning to bloom.

J. S. WISE.

Hazlehurst, Miss., Feb. 2.

[The question of forced swarming depends entirely on whether you want to take care of the swarming at your convenience, or have it take place on the hit-and-miss plan when you are away from home, or when you are busily engaged. From the mass of evidence that has been submitted, it seems clear now that one can, by the forcing plan, make the bees swarm at a time when it suits his convenience. While clipping queens' wings does away with climbing trees and chasing after swarms, yet if you happen to be absent the swarm will come back and try the same trick again. It may keep on maneuvering thus for several days, wasting their most precious time. My opinion is, judging from what I read, that you can not afford to let nature have her own way.

When bees go in quest of natural pollen it may be before or after they have brood in their hives. The presence of new pollen in the hives is quite apt to start the queen to laying, although the probabilities are that the queen has laid some eggs before

pollen has been brought in. In our locality the queen will lay a few eggs, sometimes in February, but not usually before March. A few warm days of sunshine breaks up the cluster, with the result that the queen will lay a small patch of eggs. When the next cold spell comes on, if the cluster can cover these eggs, well and good; if not, the brood dies. Egg-laying is pretty apt to precede pollen-gathering by a good many days; but when the natural pollen does come in, it usually means settled warm weather, and the queen usually tries to make the best of the opportunity offered.—Ed.]

Will you kindly tell me how to fix up a room in a barn, and about what size to have it for stores, bees, hives, etc.

EDWARD G. C. DUBOIS.

Providence, R. I., Nov. 24.

[The size of the room will depend altogether on the number of bees you expect to keep. For an apiary of 100 colonies a workshop or room 10x10 ought to be fairly ample. The room should be absolutely bee-tight—that is, if you expect to store honey in it. A self-closing screen-door should be used in connection with the regular door. The windows should be provided with bee-escapes so the bees can escape in case they get inside.—Ed.]

PASTE FOR LABELS.

In making paste for labels on tin I use equal parts of hot water and honey, and dissolve enough corn starch to make a thick paste. This works perfectly.

West Bend, Wis.

H. C. AHLERS.



The Samson hive, first used by the ancient Egyptians, afterward adopted by England as a national emblem

Out of the eater came forth meat, and out of the strong came forth sweetness.—JUDGES 14:14.



OUR OWN APIARY IN CUBA; THE GERMAN
WAX-PRESS, ETC.

After we had been running the solar wax-extractor several days with cappings there was quite an accumulation of "slumgum"—so much, in fact, that it was a hindrance to the melted wax getting through into the wax-pans below. I spread out this slumgum and let the sun work on it one day, and it seemed so free from either wax or honey I could hardly believe it of much value. As I wanted to test the wax-press, however, I decided to see how much wax I could get out of it. Robbers are very bad about the solar machine, even if it is opened only a minute in the middle of the day. I suppose it is because the hot air from the melted honey and wax draws them by the odor, just as the burning wax does when we are bee-hunting. On this account we usually open the machine either very early in the morning or after sundown, when the bees have stopped flying. Accordingly we scraped out the slumgum just at night, while it was yet hot; and then to get the wax-press at work quickly we filled the lower part with boiling water. Then we set it over a little fire outdoors. The machine has so much heavy metal about it I told the boys I feared it would be bedtime before it all got hot enough to press out every bit of wax. To my pleasant surprise, however, wax was coming from the machine in about 15 minutes, and it ran quite a stream for more than an hour. As several presses had been broken by turning too hard on the screw, I was very careful; and after we had secured much more wax than I expected to get, I decided we had got out all of any account, and let the fire go down. When we started, the wire-cloth basket was nearly full, and I presume this was rather too much for one "dose," as I discovered this morning there was yellow wax all through the remnant, and we are going to give it another "grind" to-night. I discovered that, if you turn down the screw all you think the machine will bear, in a few more minutes of steaming the screw will turn down more quite easily. When you have such a large dose in at once as we did, it takes a good deal of steaming to warm the mass clear through; and it is, therefore, best to work only a small amount at a time, as mentioned in the directions. I was not only surprised at the amount of wax obtained, but also at the *quality*. It seems to be almost as nice as that from the solar extractor. The steam extractor spoils any honey that may be in the comb or cappings, as the condensed steam dilutes it so it would be of no use, unless to make vinegar; but the solar extractor separates the honey from the wax, and makes the honey thicker; but where it runs down on the black

iron bottom, the honey is of but little value unless for feeding bees. The *taste* is not bad, yet few people would care to put such dark honey on the table. It might do very well for honey cakes or "honey gingerbread."

CUBAN APIARIES AND THE MEN WHO RUN
THEM.

The apiaries west of Havana are either close to the calzada, or pretty near to it, for convenience of getting to and from Havana, and also to save expense in moving the honey. I have been told there are better places for bees than any that are now located, but these points are so far from the railroads and the hard stone government roads (*calzadas*) that it would cost more than the honey is worth to get it to market. It has already been suggested that some one try raising wax only, in these localities, and Mr. de Beche has made some experiments that lead him to think it may be made a success. Has any one tried tearing off the combs as fast as built (and before any honey is stored in them), and compelling the bees to keep building more? Of course, brood would have to have room so as to keep up the population; but has any one succeeded in making bees work for wax only? If there are times when they won't build combs without feeding, feed back the honey that gets into the combs and has to be extracted. Wax is now worth here 35 cts., spot cash, while honey scarcely nets the bee-keeper who is away from the railroads more than *two cents a pound* at the present time. I know something about what it costs to get the crop to market, for I rode on an ox-cart, loaded with honey, five miles to the station, and it took us *two hours and a half*. This was during a dry time, when the country roads were dry and hard; but during the rainy season, in some places it would be just about impossible to get honey or any thing else to the nearest station. As a rule, however, the honey-flow is all during the winter time, when no rains come, and the ground is hard and firm. Mr. Somerford's apiary is nearest Havana on the west, and Mr. Harry Howe comes next. He is described by Ernest while in York State as the "Lightning Operator." I did not see him at work with the bees, for, to tell the truth, he, and *I too* for that matter, were more taken up with his six-months-old "girl baby" than with the bees. Mr. H. has helped to cement the union between Cuba and America by taking a Cuban lady for a wife. She is, however, a native of the Canary Islands, and a very bright little woman, although she does not as yet speak much English. The baby is not only the prettiest I saw in Cuba, but she has the sweetest name to me in *all the world*. It is just "Susie." It is Mrs. Root's name, and I have not seen her dear old self since the day after Christmas. Mr. Howe's home is in the ruins of an old stone mansion, and there are the remains of wonderful gardens of rare tropical fruits all round it.

With the exception of the pineapple, most of the new and strange Cuban fruits are too sweet for me. I did not see much of Mr. Howe's apiaries, but he was exceedingly kind in going about with me to visit other bee-keepers whom I could not well have found without his assistance. Mr. Glenn Moe, one of the leading and most successful bee-men, has his home in Candelaria. He has three apiaries, comprising nearly or quite 1000 colonies.

During the summer some kind of shade is needed, as most bee-keepers agree. Mr. Moe has secured this in one apiary, by planting bananas. These grow up in one season, and require but little care, but they give shade in the coldest months, when shade is not needed. I presume this does not matter very much unless one wants to build up weak colonies in the winter time. To do this, no doubt a clear exposure to the sun would be better, say in December and January. Mr. Moe has also some fine looking pineapples in one of his apiaries. Leaky barrels are a great trouble, and sometimes a big *expense*, in Cuba; but I believe the barrel-makers are getting the trade now so they can stop most of it. The material is shipped here from the North, and the barrels are set up here by Cuban coopers. Mr. Moe and his boys were having some trouble with barrels at one of his places when I was there. They do not seem to think it necessary to go to the expense of using paraffine, as described in the A B C. If the hoops are heavy enough to bear very heavy driving when the barrels are hot and dry, before filling, and then heavy driving *after* the honey is in, they seldom leak much. No matter how well the barrel is seasoned before filling, the honey will take out moisture from the wood so the hoops can be driven considerably after filling.

Mr. Moe wanted to "show" me some of his nice queens before I went away. I replied I cared more for what a queen could do than what she looked like. He answered:

"That is it, exactly, Mr. Root," and then he showed me a hive three stories high, and not only boiling over with bees, but with brood in all three stories; and then he told me they had gathered something like 30 gallons of honey (if I am correct), and were still at it. I think he has decided to rear queens from such colonies, without regard to *looks* of either queen or bees. I believe Dr. Miller has been doing somewhat the same. Now, if we can have all this, and at the same time get *gentle* bees, what do we care for color? Mr. Wardell tells me that, notwithstanding all that has been written on this subject, the average customer will make a fuss if he pays for an extra queen, and she isn't large and *yellow* all over. If these people would come down here and try to raise honey for two cents a pound, they might decide differently after a while.

Mr. Powers, who has charge of the Cogg-

shall apiaries between Mr. Moe and Mr. Howe, has only got started in Cuba, but he is getting things in very good shape.

Mr. Young, two miles and a half from Taco-Taco (Rambler's home), has only commenced; but he is quite enthusiastic, and has all his arrangements in very good shape. He purchased 25 nuclei in October, and built them up so as to take 1300 lbs. of honey from them before Jan. 1. He has taken considerable since, but I do not know how much.

I shall speak of Rambler's apiary further on, and also of the bees near Matanzas and some others.

I came pretty near passing by friend Hochstein, because, at the time I was nearest his place, the unusual rains in January had made it next to impossible to get from the calzada to his place, nine miles off toward the mountains. The worst part of it is, that no one could ever find his way amid the many branching footpaths, or, as we would call them in California, "trails," without a guide. After quite a spell without rain, along in February, Mr. Howe said we could get over there, and very kindly offered to go with me. I left my good friends the Frazers at Guanajay about daylight, and made the nine miles to Mr. Howe's in about an hour. Then we rode about two miles on the calzada; and two miles more across the lots over a pretty rough road brought us to Punta Brava, Mr. H.'s nearest railroad station.

There are several things to be encountered in getting to the foot of a mountain in Cuba or any other land. One is that an optical illusion persuades you that, just a little ahead, you will get to where it is *downhill*. But the "downhill" never comes. It *looks* down, but your wheel seems stubborn and contrary. When you turn around and try riding the other way, however, the wheel is all right, and goes very easily. Another thing is, that where there are few residents, gates or bars are used to keep in the stock. An open road would require a *fenced* road on both sides. To avoid this, gates or bars must be opened or let down whenever you cross on to another man's premises. When friend Hochstein hauls his honey to the station he has to go through *seven* different gates or bars. When I reached his place I was pretty tired; but the sight of his good wife and bright and enterprising family made me soon forget it. Friend H. has not only toward 500 colonies of bees (in one spot) all or nearly all in two-story hives, but he has turkeys, chickens, guinea fowls, ducks, pigs, and cattle. The poultry is nearly all in charge of a bright young lady they call Miss Emma. She has now about 200 young turkeys (40 old ones), and about as many chickens, besides other fowls. These all have to be driven into their respective coops and shut up every night, or they will be lost. Toward night it was my pleasure to see how it was done. Some of them had to be caught and carried back repeatedly. The chick-

ens *would* get up in the trees, and the ducks preferred the open air on *top* of their coops instead of being shut up. After all were in she asked her father to go with her up the mountain-side for a missing hen-turkey. It made me think of the "ninety and nine." The truant was found on a nest of eggs which she and her father brought down, and "hived" in a barrel with 18 eggs. I will tell you the rest in next issue.

TWO DAYS IN CUBA.

Surely goodness and mercy shall follow me all the days of my life, and I will dwell in the house of the Lord for ever.—PSALM 23:6.

I was up before daylight, because I had a 35-mile wheelride before me, and I wanted to take as much as I could of it before the sun became so very hot. I was going out alone among strange people, and people who did not understand my speech. As I knelt by my bed on first getting up, I said: "O Lord, *thou* knowest what this new day may bring forth, but *I* do not; bless and guide my footsteps."

I told my good friend, Mr. de Beche, I could manage very well to get food and drink, but I should be very glad if he would write something in Spanish that I could give to the people when I felt the need of one of my little naps, and he smilingly gave me a note that he said would provide me what I wanted. The calzada to Güines (pronounced *Guin*-ess) is over hills for several miles out of Havana, and I found the road quite dusty near the city, so it was not so pleasant at first; but further on it is more level, and as clean and smooth as one could ask; in fact, it is one of the finest roads for wheeling I ever saw. To add to its beauty, there are great shade-trees for miles, some of them a yard in diameter, whose great masses of foliage cut off every bit of the sun's rays. Again and again I thanked God for life, health, and strength.

About half way I reached one of the apiaries belonging to Messrs. de Beche and Craycraft; and, feeling a little tired, I gave my note to the young Cuban in charge. He took me to a house near by, where the family had just taken their ten-o'clock breakfast. Of course they urged me to sit down and have breakfast too; but I had taken a lunch a mile or two back. I asked if any of the little crowd present spoke any English, but all shook their heads, and for a while I felt like a deaf and dumb man among a crowd of lively children. While the mother prepared a room for me I began using my wits to get acquainted. For a time it seemed as if every Spanish word I knew played truant to my memory when I wanted it most. I soon, however, got the children to laughing, and then we began to get acquainted. One volunteered to show me he could count "one, two, three," in English; then another, with my assistance, counted *six*; and to encourage him I clapped my hands in approval. Seeing some schoolbooks on the table I asked one after the other to read to me in Spanish. This

they were proud to do, especially after I had praised the smaller ones by loving pats on the head after each reading. Then I volunteered to read the easy lessons in their first reader, and when the smallest reader corrected my awkward attempts at pronouncing the Spanish words their delight was complete. I thought of the Scripture words, "and a little child shall lead them." Truly a little child was leading *me*; and although I did not know it just then, the dear Savior was just in the background leading both, or, better still, leading all. I had won the children; but how should I, without speech, tell them of the "Son of God who taketh away the sins of the world"? My prayer was very unexpectedly answered. A little blackboard stood up against the wall. I have been singing Gospel hymns in Spanish at the mission meetings for several weeks past. I have partly learned the words without learning their meaning. I motioned for the chalk, and tried to write the first verse of "What a Friend we have in Jesus." I should have failed had not one of the women who had heard it somewhere come to my help. With much erasing and correcting, and with some help from the schoolmaster, who came in a little later, we had on the board:

O que amigo nos es Cristo!
El lleva nuestro dolor;
Y nos manda que llevemos
Todo a Dios en oracion.

What a friend we have in Jesus,
All our sins and griefs to bear!
What a privilege to carry
Every thing to God in prayer!

Of course, we had only the Spanish. I have given both for the convenience of our readers. Now, please notice that, although I knew not the meaning of the words I had written (of course, I knew what the *whole* meant), even the smallest one knew, for it was his mother tongue. When I commenced to *sing* in Spanish, then they clapped their hands; and when their childish voices joined in with mine, correcting my faulty pronunciation, such a flood of joy and thanksgiving filled my heart it seemed for a time as if I could not bear it all. The "deaf and dumb" stranger of half an hour before was, by a miracle (it almost seemed so to me), actually leading them in singing praises to God in their own mother tongue. I almost forgot about my nap; I forgot that I was tired; but when I had taken it, and was ready to go, they all wanted me to stay longer. One of them explained by motions that, as it was downhill toward Güines, I could make my wheel go very fast. This she illustrated by making her hands revolve one around the other. I wondered greatly at their readiness to read or sing at the invitation of a stranger. Think of the contrast between these and the Sunday-school children I told you about at Bingham, Mich., last summer. Some of our missionaries here have since informed me it is characteristic of the Cubans to answer and take hold, without embarrassment.

As I sped swiftly on the beautiful road I felt very happy. When I got to the point where the road turns down from the high land into the valley around Güines, I thought I never beheld a more lovely view—

not even the celebrated Yumuri Valley, described by Humboldt.

As I came near Güines I wondered if it were possible the day could bring forth any more experiences in the Lord's work. I remember thinking, as I came into the town, I had no right to *expect* any more such opportunities or "happy surprises" in one day. Mr. de Beche said he was sorry he could not give me a letter to some one who spoke English, but he thought I would be able to get track of them when I got there. Before I got fairly well into the town I saw a card hanging before a place looking much like Mr. Frazer's mission school at Guanajay. The card read, "Iglesia Evangelica."

Surely this must mean some kind of a mission station, I reasoned, as I rapped with the big brass knocker. Almost instantly the door was opened, and a very bright little girl (see picture) said: "Bring in your wheel, please, and come in and sit down while I call mamma."

It made me think of Pilgrim's Progress; was this the house of the "Interpreter"? Come to think of it, I believe it was, but I do not yet exactly understand how it was that I, covered with dust and sweat, and with a dusty and muddy wheel (for it had rained on the way) should get such a recep-

warm welcome to when they entertained a stranger "unawares." Pretty soon Bro. S. said he had just been over to see one of their people (a Cuban) who had just taken a great notion to bees. This young brother, Antonio Senti, has bought 100 hives, has the A B C book, price list, and GLEANINGS, and yet can scarcely read or speak a word of English. He can only look at the pictures. When told he was at the very time in a quandary about putting the hives together I proposed we go over at once and see him. I loved *him* at first sight. How could I help it when I found he was a young convert in the mission, and as zealous and full of enthusiasm to hold up the gospel as he was to learn bee culture? On the way I told Bro. S. to direct me to their best restaurant, for I had not dined except getting some crackers and coffee at a wayside grocery. He declared I should go to *his home* instead, after we had made a short call on Antonio. Now, I was so taken up with this young brother I actually *forgot* all about my lack of dinner, and so did Bro. S., but I freely forgive him. When teaching those children to sing that hymn I forgot all about being tired and sleepy. Do you remember what the Savior said to his disciples after talking with the woman at the



REV. A. WALDO STEVENSON AND FAMILY, GUINES, CUBA.

tion from the minister and his wife. They are Presbyterians, and this is a *Presbyterian* mission; but I want to assure our good friend Dr. Miller (and the women-folks *there*) that it hasn't hurt dear brother Stevenson and his good wife a *bit* to be Presbyterians. In our last issue I said some pretty extravagant things about Mr. Frazer and his wife, and now I want to say that I found another couple at Güines *exactly like them*.

When the little girl opened the door and invited me in, and when I got acquainted with these two, I thought of the words, "Surely goodness and mercy shall follow me," etc. Mr. S., years ago, had read GLEANINGS, and knew at once who it was that his wife and little girl had given such a

well? "I have meat to eat that ye know not of."

Since that exceedingly pleasant visit at the missionary's home in Güines I have secured a picture that has already been used in the *Home Missionary Monthly* (box 146 Madison Square, New York), of Bro. Stevenson, his wife, and three children, which I take great pleasure in presenting here.

I do not know but I rejoice all the more over the memory of that visit because of the fact that these people are not of my own denomination. When we are really engaged heart and soul in the Master's work, we shall not only forget to be tired and hungry, but, dear brother and sister, we shall forget whether we are Baptists, Methodists, Presbyterians, or any thing else. We shall

remember that we belong only to the Lord Jesus Christ. Some time in April there is to be a conference of all the mission workers from all the different denominations that are laboring in mission work in Cuba. Oh how glad I should be to be present at such a conference! As this does not now seem to be possible, it certainly *is* my privilege to pray that the spirit of the Lord Jesus Christ may be so poured out at that meeting that all the denominations shall clasp hands as they report progress, and unite together in the bonds of Christian fellowship.

At 5 P. M. the train brought Dr. J. Milton Green, of Havana, Superintendent of the Presbyterian missions of Cuba, who gave an address at the mission in the evening. It was a great *privilege* to meet all these. As I closed my eyes in sleep in the minister's home (he would not hear of my going elsewhere—Presbyterian *too*—do you hear, Dr. Miller?) it seemed to me just *wonderful* how my prayer of the morning had been answered. Instead of being off alone among strangers, deaf and dumb, as it were, I have found friends I am sure I shall treasure in memory as long as I live; and instead of being *dumb*, why, I don't know that I ever did much more talking in one day in my life. If Mrs. Root had been along I feel pretty sure she would have cautioned me about talking *too much*.

Bro. Stevenson did not recall what I said about being hungry in the middle of the afternoon until we were around his well-filled table a little after 5 o'clock. Then he began all at once an humble apology for having forgotten to take me to his home and give me some refreshment, as he promised to do when I spoke about going to a restaurant. I assured him that he need not apologize at all, and told him that my joy in finding a young convert hungering and thirsting for knowledge, not only of bees, but of his newly found Savior, made me entirely forget weariness or hunger, as I have mentioned above. And then I remembered one of those verses which I have been reading over and over in Spanish as well as in English, in the fourth chapter of John, which shone out just then with wonderful beauty:

Jesus saith unto them, My meat is to do the will of him that sent me, and to finish his work.

Twice during that one brief day I had caught glimpses of the wonderful truth that, when we were engaged in the Master's work, as we may be and *should* be, even fatigue and hunger vanish out of sight.

The next day it was arranged that Mr. Senti and myself were to visit Mr. Fred Somerford at Catalina, 10 miles away. The road is such we had to make it on horseback; and for the first time in 30 years I rood that distance in the saddle. Dear Bro. S. had provided himself with a lot of tracts (in Spanish). I think he got them of Dr. Green, who is agent for the American Tract Society (128 Manrique St.), and he left tracts at most of the houses on the way,

giving some words of encouragement with them. It made me feel ashamed of myself. Mr. Somerford was absent, and it was raining, so we sat down together on the porch and studied his Spanish testament and bee culture alternately. How could we two visit when neither knew the language of the other? Well, the memory of that day reminds me of a story I heard long years ago.

An Irishman had a habit of bragging about what a great fighter a one-armed brother of his was. At one time when he got a going on his favorite theme he said, "Why, Jemmy once killed two of the enemy entirely, by just knocking of their heads together." When some one asked how that could be, when "Jemmy" had only one arm, he answered, "Och! but Jemmy, when he got really *a going, a fighting*, forgot all about the one arm, and kept on fighting just the same."

Well, Antonio and I, when we got "really a going," forgot *all about* our ignorance of the other's tongue.

I grasped more Spanish in a little while, and he more English, than I would have supposed possible. When I found it impossible to get an answer to him on some moral or religious question, I would take his Spanish testament and find some appropriate passage for him to read. A man who was cutting sugar-cane was driven in by the rain. Antonio engaged in conversation with him. Pretty soon I was appealed to; my answer was given by pointing out a passage in the Spanish testament, and it took all my Spanish, I assure you, to find the passage I wanted in a testament *all Spanish*.

Mr. Somerford finally returned, and we had a brief but very pleasant visit that I shall mention elsewhere. As it continued to rain, I discovered another very pleasant surprise in regard to Cuba. We went home on the train and took our *horses* with us. The ticket for a horse costs only double that for a man.

I wondered, as I closed my eyes that second night, if it were possible still another day could afford such opportunities as the one just passed by had brought me.

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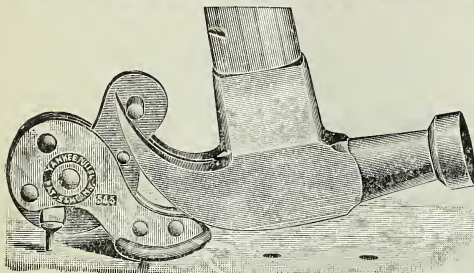
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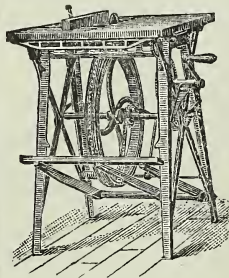
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WANTED.—To sell to supply dealers and queen-breeders list of 100 names of Idaho bee-keepers for 50c.
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WANTED.—To sell 50 stocks of Italian bees, 50 patent hives, stock of tools, implements, bee-supplies, and foot-power Barnes saw at bargains; all new. Cause, lost health and use of right hand. Write.
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WANTED.—A man with small family to work a good farm of 40 acres, and an up-to-date apiary of 200 colonies, on shares; or can work the bees without the farm. A very good chance for the right man.
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WANTED.—A position to care for bees along the Pacific coast. Have had a limited experience; am of Swedish-American descent, 24 years of age. State wages when writing.
HERMAN ROLF, Box 96, Rose Creek, Minn.

WANTED.—To sell or exchange for bees or supplies one McCormick corn-shredder, been used one week, just as good as new; and one McCormick corn-harvester, been used two seasons.
C. L. PINNEY, LeMars, Iowa.

WANTED.—Man, either married or single, to work on farm by month or year. Must not use tobacco, drink or swear. Give references, state age and experience.
C. J. BALDRIDGE, Kendaia, Seneca Co., N. Y.

WANTED.—To buy a second-hand foot and hand power saw for hive-making; Barnes or Seneca Falls combination machine preferred. State condition, make, number, and lowest cash price. Second-hand foundation-mill wanted also; must be cheap and in good condition.
J. I. CHENOVETH, Albion, La.

WANTED.—To sell for cash, 5-gal. square tin cans, used for honey, at about half price of new cans. Also elegant exhibition 12-lb. no-drip honey-cases for plain Danz. and 4½×4½ sections; made for Pan-American. For prices, etc., address OREL L. HERSHISER,
301 Huntington Ave., Buffalo, N. Y.

WANTED.—To buy 50 colonies of bees for cash; must be cheap.
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WANTED.—To sell sweet potatoes; choice seed; best varieties. Send for descriptive price list.
L. H. MAHAN, Box 143, Terre Haute, Ind.

WANTED.—To exchange for bees, parlor talking-machine, nearly new, with some sixty records.
EDWARD BROWN, Moravia, N. Y.

WANTED.—Every one interested in GOOD ROADS to read the catalog of the Electric Wheel Co., of Quincy, Ills. Mention GLEANINGS.

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WANTED.—To sell a No. 5 Seneca Falls combination sawing-machine (new) with moulding and grooving attachments.
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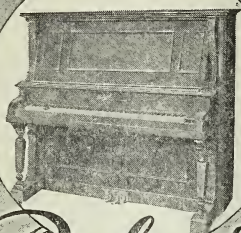
WANTED.—Experienced bee-man to take charge and run about 300 colonies; steady place for right party. State experience, reference, and wages wanted.
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R. F. D. No. 2, Fort Collins, Colorado.

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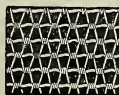
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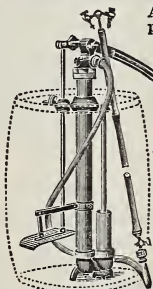
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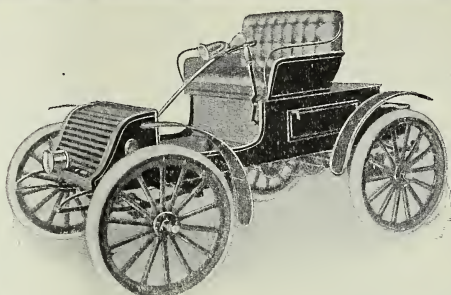
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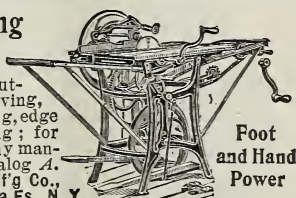
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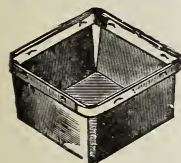
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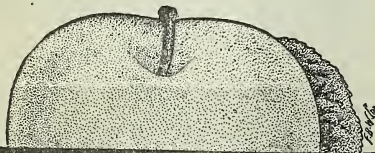
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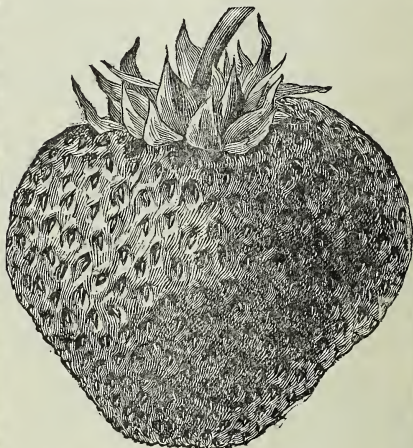
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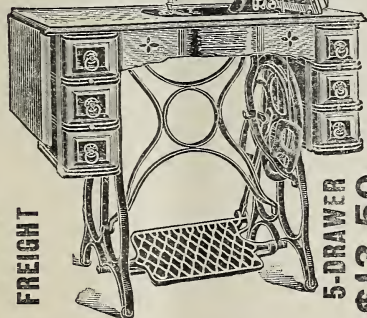
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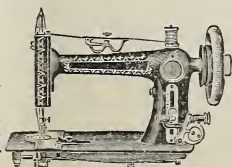
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[Established in 1873.]

Devoted to Bees, Honey, and Home Interests.

Published Semi-monthly by

The A. I. Root Co., - - Medina, Ohio.

A. I. ROOT, Editor of Home and Gardening Dep'ts.
E. R. ROOT, Editor of Apicultural Dept.
J. T. CALVERT, Bus. Mgr.
A. L. BOYDEN, Sec.

TERMS. \$1.00 per annum; two years, \$1.50; three years, \$2.00; five years, \$3.00, *in advance*; or two copies to one address, \$1.50; three copies, \$2.00; five copies, \$3.75. The terms apply to the United States, Canada, and Mexico. To all other countries 48 cents per year extra for postage.

DISCONTINUANCES. The journal is sent until orders are received for its discontinuance. We give notice just before the subscription expires, and further notice if the first is not heeded. Any subscriber whose subscription has expired, wishing his journal discontinued, will please drop us a card at once; otherwise we shall assume that he wishes his journal continued, and will pay for it soon. Any one who does not like this plan may have his journal stopped after the time paid for by making his request when ordering.



BEESWAX MARKET.

We are paying, till further notice, 29 cents cash, or 31 in trade, for average; one cent extra for choice yellow wax.

THREE CARLOADS OF HONEY-JARS.

We have orders with two factories for three carloads of honey-jars to be delivered soon. One car of No. 25 jars and Mason jars goes to our branch in Mechanic Falls, Maine, while another car is coming here. The third car is of square jars also—Tiptop jars. We are getting in position to take care of orders for honey-jars promptly, and at the best available price.

BUSINESS BOOMING.

The orders continue to roll in of good volume, so that we are still fifteen cars behind on orders for carloads. Smaller orders are shipped with reasonable promptness within two or three days after being received. The railroads continue to annoy by delay to shipments in transit. The consequence of such delays in bee-keepers' supplies are not quite so serious now as they will be later on; and it is of the highest importance that you anticipate your wants as far in advance as possible, so as not to be without the goods when the time comes that you are ready to use them. Two per cent off for cash with order this month.

SECOND-HAND FOUNDATION-MILLS.

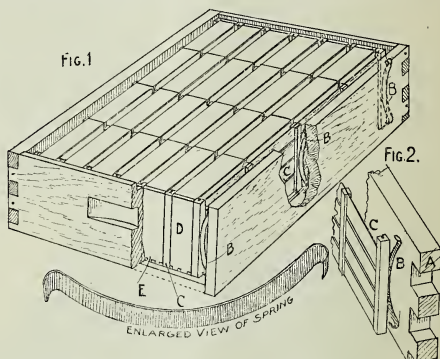
We still have on hand a good assortment of second-hand foundation-mills, which we list as follows. Any one desiring samples from these mills, or further particulars, we shall be pleased to supply on application.

No. 014, 2x6, hex. cell, extra-thin super. Price \$8.00.
No. 037, 2x6, hex. cell, ex thin super, good. Price \$10.
No. 2132, 2x6, hex. cell, thin super. Price \$10.
No. 2227, 2x6, hex. cell, thin super. Price \$10.
No. 045, 2½x6, hex. cell, thin super. Price \$10.
No. 050, 2½x12, round cell, medium. Price \$12.

No. 044, 2x10, Pelham, nearly new. Price \$6.
No. 084, 2½x12½, round cell, very old style, in fair condition. Price \$10.
No. 043, 2½x14, round, medium to heavy, good condition. Price \$14.
No. 051, 2x10, round cell, medium brood. Price \$10.

THE NEW SUPER SPRINGS FOR 1903.

We have up until lately been using wire springs to produce the necessary compression in comb-honey supers. These were secured to the inside of the super side. There came to be a general demand for a *removable* spring, and we accordingly constructed some samples made of wire; but owing to the difficulties of manufacture, and the further fact that the tension of the wire varied considerably, we finally decided on flat steel springs of the shape and style shown in the annexed engraving. This spring is very similar to if



not identical with the super-spring first used by Capt. J. E. Hetherington, of Cherry Valley, N. Y., some 30 years ago, and which, we understand, he has been using ever since. While this form of spring is a little more expensive for the material used, it is easier to make. The Root Co. is now turning out these springs by the thousand. All the 1903 supers put out by us from this date on will have these springs; and we anticipate they will be well received by the general bee-keeping public. Capt. Hetherington, who for many years enjoyed the reputation of being the most extensive bee-keeper in the world, is not apt to adopt an impracticable device; and the fact that he pronounces the principle good is pretty good evidence that the fraternity at large can safely adopt it. There are those who prefer a spring fast to the super instead of loose. By putting the spring in position, and driving a staple over one end, these may be securely fastened. A staple similar to the No. 11 double-pointed tack but a little wider is needed. We will have them soon at 20 cts. per pound.

Special Notices by A. I. Root.

I am at home again in Medina.—A. I. Root.

JAPANESE BUCKWHEAT.

Trial packet, 4 ounces, by mail, postpaid, 5c; 1 lb. by mail, postpaid, 15c; peck, 35c; ½ bushel, 65c; bushel, \$1.25; 2 bushel, \$2.25. These prices include bag to ship it in. Ten or more bushels, purchaser paying for bags, 95 cents.

CUCUMBER SEED LOWER.

Until further notice we can make the price of Early Frame, Improved Early White Spine, and Green Prolific or Boston Pickle cucumber seed at 15 cents per ounce, or \$1.25 per lb. This is for new fresh seed, grown expressly for us.

PRICES ON CLOVER SEED AT THIS DATE.

Alsike clover, bu., \$10; ½ bu., \$5.25; peck, \$2.75; 1 lb., 20c, or by mail, 30c.
Medium clover, bu., \$9.00; ½ bu., \$4.75; peck, \$2.50; 1 lb., 18c, or 28c by mail.
White Dutch clover, bu., \$15.00; ½ bu., \$7.75; pk., \$4.00; 1 lb., 30c; 1 lb. by mail, 40c.

Peavine, or Mammoth Red clover, same as medium. Alfalfa, same as medium.
Crimson, or scarlet clover, bu., \$4.50; $\frac{1}{2}$ bu., 2.40; peck, \$1.25; 1 lb., 10c, by mail 20c; 3 lbs., by mail, 50c.
Sweet clover, 100 lbs., 10c per lb.; 10 lbs., at 12c; 1 lb., 15c; by mail, 25c per lb. Yellow sweet clover, 6c per lb. additional. For sweet clover with hulls off, 5c per lb. in addition to the above prices.

SEED POTATOES—ORDER EARLY.

If you send in your order now you can get them without being sprouted a particle. You can get exactly what you want, for our stock of firsts is all complete; and, most of all, you can save disastrous delays by not getting them when you are ready to plant. Freight of all kinds, as you may know, is more or less delayed by the overcrowded condition of the railroads generally; therefore it will be better all around to get your order in at once.

TABLE OF PRICES.

NAME.	1 lb. by mail.	3 lbs. by mail.	Half Peck.	Peck.	Half Bushel.	Bushel.	Barrel, 11 pks.
Varieties are in order as regards time of maturing; earliest first, next earliest second, and so on.							
Red Bliss Triumph.....	\$ 18	\$ 40	\$ 30	\$ 40	\$ 75	\$ 125	\$3.00
Six Weeks	18	40	30	40	75	125	3.00
Early Ohio.....	18	40	30	40	75	125	3.00
Early Michigan.....	18	40	30	40	75	125	3.00
Early Trumbull.....	18	40	30	40	75	125	3.00
Bovee.....	18	40	30	40	75	125	3.00
New Queen.....	18	40	30	40	75	125	3.00
Freeman.....	18	40	30	40	75	125	3.00
Lee's Favorite.....	18	40	30	40	75	125	3.00
Twentieth Century.....	15	35	20	35	60	100	2.50
State of Maine.....	15	35	20	35	60	100	2.50
Maule's Commercial.....	15	35	20	35	60	100	2.50
Carman No. 3.....	15	35	20	35	60	100	2.50
Sir Walter Raleigh.....	15	35	20	35	60	100	2.50
King of Michigan.....	25	50	35	50	85	150	3.50
California Russet.....	15	35	20	35	60	100	2.50
New Oraig.....	15	35	20	35	60	100	2.50

Seconds, while we have them, will be half price (for description of seconds see page 828), but at the present writing, Jan. 1, we are sold out of seconds except the following four kinds: Early Michigan, Lee's Favorite, New Queen, and Maule's Commercial.

A barrel can be made up of as many varieties as you choose, and they will be at barrel prices if you have a whole barrel or more.

POTATOES AND GARDEN SEEDS TO BE GIVEN AWAY.

Everybody who sends \$1.00 for GLEANINGS (asking for no other premium), may have 25 cents' worth of potatoes, seeds, etc., providing he mentions it at the time he sends in the money; and every subscriber who sends us \$1.00 for a new subscriber so that GLEANINGS may go into some neighborhood or family where it has not been before, may have 50 cents' worth of potatoes, seeds, etc.

You can have your premium potatoes sent by mail, express, or freight; but if you want them by mail, you must send the money for postage. For 25 cents you can have 5 lbs. of potatoes; but the postage and packing amounts to ten cents for each pound; and I do not believe you want to pay 50 cts. in postage for 25 cents' worth of potatoes. As a rule, potatoes should go only by freight; 25 cents' worth is hardly enough for a freight shipment; so by far the better way would be to have them shipped by freight with other goods. The express charges on only 25 cents' worth are very often as much as the postage, and sometimes more.

OUR NORTHERN-GROWN SEED POTATOES.

The Red Triumph is perhaps the earliest potato known, but it is very apt to blight in many localities. Six weeks is a select *extra early* strain of Early Ohio. The Early Ohio is the standard early potato almost the world over; but as a rule it is not a large yielder. Early Michigan is one of the very earliest potatoes, and is almost without a fault as to quality, quantity, etc. Early Trumbull is not quite as early as the foregoing, but it is a tremendous yielder. The Bovee has made quite a sensation since its advent four or five years ago. New Queen, in many localities, seems to be the "queen" of the lot, a little later than the foregoing, but a tremendous yielder. The Freeman is the first really handsome potato among the extra earlys. Lee's Favorite looks almost exactly like the New Queen, but it is a little later. Twentieth Century, State of Maine, Carman No. 3, and Sir Walter Raleigh, are all tre-

mendous yielders; and on our ranch last year in Northern Michigan they looked so much alike the boys said there was hardly a choice in the lot. Maule's Commercial stands well with the lot just enumerated, and perhaps it will outyield any of them; but it is a *red-dish* potato. Whitten's White Mammoth is one of the largest yielders, and is a potato of excellent quality; but it is not as handsome in shape as the Carman No. 3 and some others. The California Russet is equal in quality, probably, to any in the list, and stands out sharp and clear above all, as the potato having no scab. It may not yield as well as some others, and the tubers are not quite as handsome, although they are of good shape; but there are never any scabby ones. The New Craig is certainly the latest of all potatoes, giving some of the largest crops, providing you can give it the whole season to grow in. Plant them early, and they will keep growing till frost.

COLD-FRAME OR HOT-BED SASH OF CYPRESS.

We are now prepared to furnish sash of cypress, having secured a supply of this lumber for the purpose. It is one of the most durable of woods for outside use, and is largely used for greenhouse bars and sash. It is light and strong, as well as durable. We are changing the dimensions of the bars so that they will shut off less light from the seed-bed. The thickness will be $\frac{1}{2}$ inches instead of $\frac{3}{4}$, as formerly, with tenons $\frac{1}{4}$ inch thick instead of $\frac{3}{8}$ inch. The outside bars are $\frac{3}{4}$ inches wide instead of $\frac{5}{8}$. The sash will still be 6 feet long, but 3 ft. 3 inches wide instead of 3 ft. 4 inches, and, as regularly furnished, will take four rows of 8x10 glass. We can also supply them for 3 rows of 11-inch glass. The price shipped, knocked down, will be 80 cents each; \$3.75 for 5, or \$7.00 for 10.

We still have the old-style pine sash, 3 ft. 4 by 6 ft., which we will sell at the same price if any prefer them. At the present price of pine lumber they are worth more money, but we will close them out at this price to any who may want them. Glass, 8x10, for sash at \$3.00 per box; 5 boxes at \$2.85; 10 boxes at \$2.70

A NEW TESTAMENT IN SPANISH AND ENGLISH.

We have just received from the American Bible Society a lot of Testaments, one column printed in Spanish and the other in English—that is, the two are side by side. I can heartily recommend this Testament as a method of learning Spanish. If you read your Bible every day—and I hope there are many of our readers who do this—with one of these English-Spanish Testaments you can also read a little Spanish every day; and you will be surprised to learn how soon the Spanish words will become familiar to you. Of course, few will undertake this unless they are in localities where Spanish is largely spoken. I hope the bee-keepers of Cuba will all provide themselves with such a Testament; and I know by experience that in California, Arizona, Mexico, and many other parts of the great West, a little Spanish is a great benefit; and I know, too, from experience, that it is a wonderful privilege to anybody who loves God's holy word to be able to get it in another language than his own. The mental exercise, and the real honest enjoyment that I get out of my Spanish-English Testament, have been worth to me a hundred times what it cost. The books are billed to us by the American Bible Society at just 25 cents each, which we sell them for. If wanted by mail, add 9 cents for postage. As an incentive to young people to take up the study of Spanish, permit me to mention that a shorthand writer who can read, write, and speak English and Spanish, can command in Havana from \$125 to \$150 per month. A book-keeper who is conversant with both English and Spanish can command from \$75 to \$100 per month. I hardly need mention that this book will be equally valuable to Spanish people who are learning English; and I wish our American friends would present the matter to their Spanish neighbors. Just think of it, dear friends—at the same time they are learning our language they will be getting a knowledge of the word of God that will raise men out of darkness and into the light.

CONVENTION NOTICES.

The Northern Michigan bee-keepers will hold a convention, March 25 and 26, in the town hall, at Bellaire, Antrim County. Special rates have been secured for entertainment at the Ellis House and the Bellaire House, at \$1.00 per day. A. I. Root expects to be present, and give a talk on Cuba.

PAGE & LYON,

New London, Wisconsin.

MANUFACTURERS OF
AND DEALERS IN . . .

BEE-KEEPERS' SUPPLIES. . . .

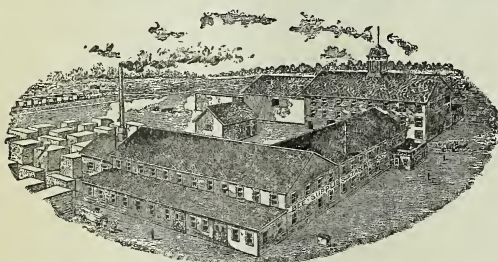
Send for Our Free New Illustrated
Catalog and Price List.

We Have Not Moved.

The government, recognizing the necessity of a great and growing business enterprise, for better mail service has given us a postoffice on our premises, which enables us to change mails with the passing trains instead of through the Wetumpka, Alabama, postoffice more than a mile distant. This gives us our mails about two hours earlier, and also one hour for making up outgoing mail. This will be particularly helpful in our queen business. We are now booking orders for Italian queens, Long-tongued and Leather colored; both good.

J. M. Jenkins,
Honeysuckle, Alabama.

Shipping-point and Money-order
Office at Wetumpka, Alabama.



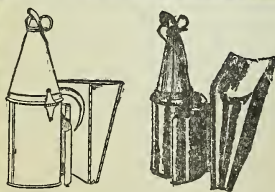
BEE-SUPPLIES.

Best-equipped factory in the West; carry a large stock and greatest variety of every thing needed in the apiary, assuring BEST goods at the LOWEST prices, and prompt shipment. We want every bee-keeper to have our FREE ILLUSTRATED CATALOG, and read description of Alternating Hives, Ferguson Supers, etc. Write at once for a catalog.

— AGENCIES —

Kretchmer Mfg. Co., Box 60, Red Oak, Ia.

Trester Supply Company, Lincoln, Neb.
Shugart & Ouren, Council Bluffs, Ia.
Chas. Spangler, Kentland, Ind.



BINGHAM SMOKER.

Dear Sir:—Inclosed find \$1.75. Please send one brass smoke-engine. I have one already. It is the best smoker I ever used.

Truly yours,
HENRY SCHMIDT, Hutto, Tex.

MADE TO ORDER

Bingham Brass Smokers.

Made of sheet brass, which does not rust or burn out; should last a lifetime. You need one, but they cost 25 cts. more than tin of the same size. The little open cut shows our brass hinge put on the three larger sizes. No wonder Bingham's four-inch smoke-engine goes without puffing, and does not drop ink drops. The perforated steel fire-grate has 381 holes to air the fuel and support the fire. Heavy tin smoke-engine, 4-inch stove, per mail, \$1.50; 3½-inch, \$1.10; 3-inch, \$1.00; 2½-inch, 90c; 2-inch, 60c. Bingham smokers are the originals, and have all the improvements, and have been the standard of excellence for 23 years. Only three larger ones brass.

T. F. Bingham, Farwell, Michigan.



Established 1884.

BEE-KEEPERS' SUPPLIES!

In placing your orders for the coming season of 1903 do not forget that we always carry a stock of THE A. I. ROOT COMPANY'S goods that are needed in a well-equipped apiary. We can sell you these goods as cheap as they can be had from the factory, owing that we get carload shipments from which we can supply your wants on short notice, and at a saving of freight.

We ask a trial order to convince you that we can serve you right. Send for our 40-page catalog, free.

BEESWAX WANTED.

JNO. NEBEL & SON,

High Hill, Missouri.



Minnesota,
Dakota,
Western
Wisconsin

BEE-KEEPERS!

Our 33d annual catalog for 1903 (92d edition) is now ready. Send for a copy at once. We have a full line of goods in stock, and can fill your orders promptly. Save freight by ordering from the St. Paul branch. **Bees and Queens.** Orders booked now for spring delivery. **Honey and Wax.** We handle honey and wax. Write for particulars.

The A. I. ROOT COMPANY

NORTHWESTERN BRANCH

1026 Miss. St., St. Paul, Minn.

Headquarters in CALIFORNIA!

We wish to remind GLEANINGS readers that we are again ready to serve them with whatever they require in Bee-keepers' Supplies. We not only have a good assortment of our own manufacture but we can furnish a

Full Line of Root's Sundries

such as Smokers, Sections, Cowan Extractors, etc. Let us have your name and address at once, and we will send you our catalog.

Union Hive & Box Co.
Los Angeles, Cal.

Oregon Bee-keepers



For years we have supplied you with a portion of your requirements in bee-keepers' Supplies, for which we thank you. We are better prepared than ever to take good care of orders this season. We have acquired the business of Buell Lamberson's Sons, of this place, and have the agency for this State for

The A. I. Root Co., Medina, Ohio.

One carload is already on the way, and others will follow. If you require special goods or anything not usually kept in Western stocks, we can get it for you on our next car.

Seeds, Fertilizers, Trees, Garden Tools, Poultry and Bee Supplies.

Portland Seed Company,
Portland, Oregon.

Texas Bee-keepers.

STOCK.—Our warehouse is now stocked with a good assortment of Hives, Sections, Extractors, and other supplies direct from Medina.

PROMPTNESS.—We can therefore fill your orders promptly. Do not suffer long delay by ordering from some distant point but send orders here.

HEADQUARTERS for bee-keepers in San Antonio. Whenever you visit San Antonio you are invited to call at our office and make it your headquarters. See our display of supplies. Leading bee-journals on file for your perusal too.

WANTED.—Beeswax and Honey. Write for particulars.

The A. I. Root Co.,

438 West Houston Street,

San Antonio, Texas.

BEEKEEPERS

Notice

We sell the Root goods here at Root's factory prices, which means the freight is paid to Des Moines, Iowa.

Immense stock and every variety of the best up-to-date goods now on hand packed for prompt shipment.

Satisfaction is guaranteed on every order sent us. Thousands have been pleased with their goods from us. We can satisfy you.

Write for estimates, sending list of what you will need, and get our discounts for early orders. We will save you money. Send to-day for 1903 catalog.

JOS. NYSEWANDER,

710-12 W. Grand Ave.

DES MOINES, IOWA.

— 26th Year —

Dadant's Foundation.

WHY DOES IT SELL SO WELL?—Because it has always given better satisfaction than any other. Because in 25 YEARS there have been no complaints, but thousands of compliments.

WE GUARANTEE SATISFACTION.—What more can anybody do? Beauty, purity, firmness, no sagging, no loss. **PATENT WEED PROCESS OF SHEETING.**

BEEWAX WANTED AT ALL TIMES.—Send name for our catalog, samples of foundation, and veil material. We sell the best veils, either cotton or silk.

LANGSTROTH ON THE HONEY-BEE, Revised. The classic in bee-literature. \$1.20 by mail.

Bee-Keepers Supplies
of All Kinds.

DADANT & SON,
Hamilton, Ill.

Why Not



Place your order now? We will make you special prices for early delivery. We are headquarters in Central California for Root's Cowan Extractors, Sections, Weed Foundation, Smokers, etc., as well as a full line of local-made supplies. We can give you prompt service. We solicit your patronage.

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Madary's Planingmill
Fresno, California.